<html lang="en-US" class="no-js"><head> <meta charset="UTF-8">
<title>How to inspect element on iPhone | BrowserStack</title> <meta http-equiv="X-UA-Compatible" content="IE=edge,chrome=1">
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<meta name="facebook-domain-verification" content="joy2k7rhws0m7eufhx1fdmv9bowjbh">
<style id="bstack-fcp-header-inline-css" type="text/css">article,aside,details,figcaption,figure,footer,header,hgroup,nav,section,summary{display:block}audio,canvas,video{display:inline-block}audio:not([controls]){display:none;height:0}[hidden],template{display:none}html{background:#fff;color:#000;-webkit-text-size-adjust:100%;-ms-text-size-adjust:100%}html,button,input,select,textarea{font-family:sans-serif}body{margin:0}a{background:transparent}a:hover,a:active{outline:0}h1{font-size:60px;margin:.67em 0}h2{font-size:45px;margin:.83em 0}h3{font-size:28px;margin:1em 0}h4{font-size:1em;margin:1.33em 0}h5{font-size:.83em;margin:1.67em 0}h6{font-size:.75em;margin:2.33em 0}abbr[title]{border-bottom:1px dotted}b,strong{font-weight:bold}dfn{font-style:italic}mark{background:#ff0;color:#000}code,kbd,pre,samp{font-family:monospace,serif;font-size:1em}pre{white-space:pre;white-space:pre-wrap;word-wrap:break-word}q{quotes:"\201C" "\201D" "\2018" "\2019"}q:before,q:after{content:'';content:none}small{font-size:80%}sub,sup{font-size:75%;line-height:0;position:relative;vertical-align:baseline}sup{top:-0.5em}sub{bottom:-0.25em}img{border:0}svg:not(:root){overflow:hidden}figure{margin:0}fieldset{border:1px solid silver;margin:0 2px;padding:.35em .625em .75em}legend{border:0;padding:0;white-space:normal}button,input,select,textarea{font-family:inherit;font-size:100%;margin:0;vertical-align:baseline}button,input{line-height:normal}button,select{text-transform:none}button,html input[type="button"],input[type="reset"],input[type="submit"]{-webkit-appearance:button;cursor:pointer}button[disabled],input[disabled]{cursor:default}button::-moz-focus-inner,input::-moz-focus-inner{border:0;padding:0}textarea{overflow:auto;vertical-align:top}table{border-collapse:collapse;border-spacing:0}input[type="search"]{-webkit-appearance:textfield;box-sizing:content-box}input[type="search"]::-webkit-search-cancel-button,input[type="search"]::-webkit-search-decoration{-webkit-appearance:none}input[type="checkbox"],input[type="radio"]{box-sizing:border-box;padding:0}html{box-sizing:border-box}*,*:before,*:after{box-sizing:inherit}html,body{height:100%}body{color:#333;background-color:white;line-height:21px}body.features{font-family:"source-sans-pro",helvetica}ul{list-style-type:none}a{text-decoration:none;color:#0070f0}a:active,a:hover,a:visited{outline:0}a:hover{col

or:#004b8f}main a{text-decoration:underline}main a:hover{text-decoration:underline}strong{font-weight:600}input[type=checkbox]:focus{outline:0}input::-ms-clear,input::-ms-reveal{display:none}textarea{resize:none}.hide{display:none}input[type=number]::-webkit-outer-spin-button,input[type=number]::-webkit-inner-spin-button{-webkit-appearance:none;margin:0}input[type=number]{-moz-appearance:textfield}.container{max-width:100%;margin:0 auto}@media screen and (min-width:640px){.container{width:640px}}@media screen and (min-width:980px){.container{width:960px}}@media screen and (min-width:1300px){.container{width:1280px}}@media screen and (min-width:1600px)
{.container{width:1280px}}.row:after{content:"";clear:both;display:table}.col-xs-1,.col-xs-2,.col-xs-3,.col-xs-4,.col-xs-5,.col-xs-6,.col-xs-7,.col-xs-8,.col-xs-9,.col-xs-10,.col-xs-11,.col-xs-12,.col-sm-1,.col-sm-2,.col-sm-3,.col-sm-4,.col-sm-5,.col-sm-6,.col-sm-7,.col-sm-8,.col-sm-9,.col-sm-10,.col-sm-11,.col-sm-12,.col-md-1,.col-md-2,.col-md-3,.col-md-4,.col-md-5,.col-md-6,.col-md-7,.col-md-8,.col-md-9,.col-md-10,.col-md-11,.col-md-12,.col-lg-1,.col-lg-2,.col-lg-3,.col-lg-4,.col-lg-5,.col-lg-6,.col-lg-7,.col-lg-8,.col-lg-9,.col-lg-10,.col-lg-11,.col-lg-12,.col-lg-13,.col-lg-14,.col-lg-15,.col-lg-16,.col-xl-1,.col-xl-2,.col-xl-3,.col-xl-4,.col-xl-5,.col-xl-6,.col-xl-7,.col-xl-8,.col-xl-9,.col-xl-10,.col-xl-11,.col-xl-12,.col-xl-13,.col-xl-14,.col-xl-15,.col-xl-16{float:left;padding-left:10px;padding-right:10px}.col-center{margin:0 auto;float:none}.no-pad{padding-left:0;padding-right:0}.no-pad-left{padding-left:0}.no-pad-right{padding-right:0}.pull-right{float:right}.pull-left{float:left}.col-xs-1{width:8.33333%}.col-xs-offset-1{margin-left:8.33333%}.col-xs-2{width:16.66667%}.col-xs-offset-2{margin-left:16.66667%}.col-xs-3{width:25%}.col-xs-offset-3{margin-left:25%}.col-xs-4{width:33.33333%}.col-xs-offset-4{margin-left:33.33333%}.col-xs-5{width:41.66667%}.col-xs-offset-5{margin-left:41.66667%}.col-xs-6{width:50%}.col-xs-offset-6{margin-left:50%}.col-xs-7{width:58.33333%}.col-xs-offset-7{margin-left:58.33333%}.col-xs-8{width:66.66667%}.col-xs-offset-8{margin-left:66.66667%}.col-xs-9{width:75%}.col-xs-offset-9{margin-left:75%}.col-xs-10{width:83.33333%}.col-xs-offset-10{margin-left:83.33333%}.col-xs-11{width:91.66667%}.col-xs-offset-11{margin-left:91.66667%}.col-xs-12{width:100%}.col-xs-offset-12{margin-left:100%}@media screen and (min-width:640px){.col-sm-1{width:8.33333%}.col-sm-offset-1{margin-left:8.33333%}.col-sm-2{width:16.66667%}.col-sm-offset-2{margin-left:16.66667%}.col-sm-3{width:25%}.col-sm-offset-3{margin-left:25%}.col-sm-4{width:33.33333%}.col-sm-offset-4{margin-left:33.33333%}.col-sm-5{width:41.66667%}.col-sm-offset-5{margin-left:41.66667%}.col-sm-6{width:50%}.col-sm-offset-6{margin-left:50%}.col-sm-7{width:58.33333%}.col-sm-offset-7{margin-left:58.33333%}.col-sm-8{width:66.66667%}.col-sm-offset-8{margin-left:66.66667%}.col-sm-9{width:75%}.col-sm-offset-9{margin-left:75%}.col-sm-10{width:83.33333%}.col-sm-offset-10{margin-left:83.33333%}.col-sm-11{width:91.66667%}.col-sm-offset-11{margin-left:91.66667%}.col-sm-12{width:100%}.col-sm-offset-12{margin-left:100%}}@media screen and (min-width:979.1px){.col-md-1{width:80px}.col-md-offset-1{margin-left:80px}.col-md-2{width:160px}.col-md-offset-2{margin-left:160px}.col-md-3{width:240px}.col-md-offset-3{margin-left:240px}.col-md-4{width:320px}.col-md-offset-4{margin-left:320px}.col-md-5{width:400px}.col-md-offset-5{margin-left:400px}.col-md-6{width:480px}.col-md-offset-6{margin-left:480px}.col-md-7{width:560px}.col-md-offset-7{margin-left:560px}.col-md-8{width:640px}.col-md-offset-8{margin-left:640px}.col-md-9{width:720px}.col-md-offset-9{margin-

left:720px}.col-md-10{width:800px}.col-md-offset-10{margin-left:800px}.col-
md-11{width:880px}.col-md-offset-11{margin-left:880px}.col-md-
12{width:960px}.col-md-offset-12{margin-left:960px}}@media screen and
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lg-2{width:160px}.col-lg-offset-2{margin-left:160px}.col-lg-3{width:240px}.col-
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12{width:960px}.col-lg-offset-12{margin-left:960px}.col-lg-
13{width:1040px}.col-lg-offset-13{margin-left:1040px}.col-lg-
14{width:1120px}.col-lg-offset-14{margin-left:1120px}.col-lg-
15{width:1200px}.col-lg-offset-15{margin-left:1200px}.col-lg-
16{width:1280px}.col-lg-offset-16{margin-left:1280px}}@media screen and
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xxl-1{width:100px}.col-xxl-offset-1{margin-left:100px}.col-xl-
2{width:160px}.col-xl-offset-2{margin-left:160px}.col-xxl-2{width:200px}.col-
xxl-offset-2{margin-left:200px}.col-xl-3{width:240px}.col-xl-offset-3{margin-
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xxl-offset-8{margin-left:800px}.col-xl-9{width:720px}.col-xl-offset-9{margin-
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16{width:1280px}.col-xl-offset-16{margin-left:1280px}.col-xxl-
16{width:1600px}.col-xxl-offset-16{margin-left:1600px}}.no-pad{padding-
left:0;padding-right:0}.no-pad-right{padding-right:0}.no-pad-left{padding-
left:0}.hide{display:none}@media screen and (max-width:639px){.hide-
xs{display:none !important}}@media screen and (min-width:640px) and (max-
width:979px){.hide-sm{display:none !important}}@media screen and (min-
width:979.1px) and (max-width:1299px){.hide-md{display:none !
important}}@media screen and (min-width:1300px) and (max-width:1599px)
{.hide-lg{display:none !important}}@media screen and (min-width:1600px)
{.hide-xl{display:none !important}}div[class^="vc_custom_"],div[class*='
vc_custom_']{background-size:cover !important}.btn-primary,.btn-

secondary,.btn-transparent,.btn-secondary-white,.btn-tertiary,.btn-secondary-gray,.btn-primary-green,.btn-primary-red,.btn-green-secondary{border-radius:3px;border:1px solid transparent;display:inline-block;padding:10px 20px 10px;text-decoration:none !important}.btn-primary{background-color:#0070f0;color:white;text-align:center;line-height:21px;font-size:16px;font-weight:400;font-family:"source-sans-pro",helvetica}.btn-primary:hover{background-color:#004b8f;color:white;text-decoration:none !important}.btn-primary.disabled,.btn-primary[disabled]{cursor:default;background-color:#42a9ff}.btn-secondary{background-color:transparent;color:#0060c1;text-align:center;line-height:21px;font-size:16px;font-weight:400;font-family:"source-sans-pro",helvetica;border-color:#0060c1}.btn-secondary:hover{border-color:#004b8f;background-color:#004b8f;color:white;text-decoration:none !important}.btn-secondary.disabled,.btn-secondary[disabled]{border-color:#42a9ff;color:#42a9ff;cursor:default}.btn-transparent{background-color:transparent;color:#999;text-align:center;line-height:21px;font-size:16px;font-weight:400;font-family:"source-sans-pro",helvetica}.btn-transparent:hover{color:#333;text-decoration:none !important}.btn-secondary-white{background-color:transparent;color:white;text-align:center;line-height:21px;font-size:16px;font-weight:400;font-family:"source-sans-pro",helvetica;border-color:white}.btn-secondary-white:hover{border-color:white;border-color:rgba(255,255,255,0.6);color:white;color:rgba(255,255,255,0.6);background-color:white;color:#0070f0;text-decoration:none !important}.btn-tertiary{background-color:transparent;color:white;text-align:center;line-height:21px;font-size:16px;font-weight:400;font-family:"source-sans-pro",helvetica;border-color:white}.btn-tertiary:hover{background-color:white;color:#004b8f;text-decoration:none !important}.btn-secondary-gray{background-color:transparent;color:#999;text-align:center;line-height:21px;font-size:16px;font-weight:400;font-family:"source-sans-pro",helvetica;border-color:#999}.btn-secondary-gray:hover{border-color:#333;color:#333;text-decoration:none !important}.btn-primary-green{background-color:#bfff66;color:white;text-align:center;line-height:21px;font-size:16px;font-weight:400;font-family:"source-sans-pro",helvetica;background-color:#68b300}.btn-primary-green:hover{background-color:#599900;color:white;text-decoration:none !important}.btn-primary-green.disabled,.btn-primary-green[disabled]{background-color:#c9e3a6;cursor:default}.btn-primary-red{background-color:#f9dad7;color:white;text-align:center;line-height:21px;font-size:16px;font-weight:400;font-family:"source-sans-pro",helvetica}.btn-primary-red:hover{background-color:#b82616;color:white;text-decoration:none !important}.btn-primary-red.disabled,.btn-primary-red[disabled]{background-color:#ed8277;cursor:default}.btn-green-secondary{background-color:transparent;color:#bfff66;text-align:center;line-height:21px;font-size:16px;font-weight:400;font-family:"source-sans-pro",helvetica;border-color:#bfff66}.btn-green-secondary:hover{border-color:#599900;color:#599900;text-decoration:none !important}.btn-green-secondary.disabled,.btn-green-secondary[disabled]{border-color:#c9e3a6;color:#c9e3a6;cursor:default}.btn-lg{line-height:21px;font-size:18px;padding:15px 20px}.btn-md{font-size:16px;line-height:21px;padding:10px 15px}.btn-sm{font-size:14px;padding:10px 15px}.btn-xsm{font-size:12px}.btn-round{border-radius:50%}.btn-badge{font-size:12px;line-height:15px;padding:0 7px}@media screen and (max-width:979px){.btn-lg{font-size:16px;padding:8px 20px}}.vertical-

list{margin:0;padding:0}.horizontal-list{margin:0;padding:0}.horizontal-list>li{display:inline-block}body{font:normal normal 300 16px/21px "myriad-pro",helvetica}h1,h2,h3,h4,h5,h6{color:#333;font:normal normal 300 60px/63px "source-sans-pro",helvetica;margin:0}h1{font-size:60px;line-height:63px;font-weight:300}h2{font-size:45px;line-height:49px;font-weight:400}h3{font-size:28px;line-height:32px;font-weight:400}h4,h5,h6{font-size:21px;line-height:32px;font-weight:400}.seo-header{font-size:45px;line-height:49px;font-weight:400}.text-center{text-align:center}.text-right{text-align:right}.invert{color:black}.invert h1,.invert h2,.invert h3,.invert h4,.invert h5,.invert h6,.invert p{color:white}@media screen and (max-width:979px){h1{font-size:36px;line-height:46px}h2{font-size:32px;line-height:38px}h3{font-size:26px;line-height:32px}h4,h5,h6{font-size:18px;line-height:21px}}.contact-pill,.cookie-notification,.bs-modal,.docs--container,#docs--language-modal{display:none}body{margin:0;background:white}.secondary-nav{position:absolute;top:63px}.promo-notification{padding:11px 20px 10px;font-size:16px;line-height:21px}.promo-notification__actions{display:none}.promo-notification p{margin:0}a.skip-link{position:absolute;top:-100px;left:4px;background-color:white;color:#0070f0;margin:1px;padding:8px 20px;z-index:10000;height:auto;width:auto;font-size:16px;line-height:24px;font-weight:400;font-family:"myriad-pro",helvetica;border-radius:3px}a.skip-link:focus{top:9px}.header-habitat{position:relative;width:100%;top:0;left:0;background-color:#142433;color:#333;font-weight:300;z-index:99;height:63px}.header-habitat .logo{padding-top:15px;display:block;float:left;margin-right:10px;padding-bottom:10px}.header-habitat .container.top-bar-menu-container{position:relative;max-width:100%;margin:0 auto}.header-habitat .container.top-bar-menu-container .col-xs-12:first-child{padding-left:10px;padding-right:10px}.header-habitat .secondary-nav .product-name{font-size:26px}@media screen and (min-width:640px){.container{width:640px}}@media screen and (min-width:979.1px){.container{width:960px}.persistent-header:not(.header-with-promo-bar){padding-top:63px}.persistent-header:not(.header-with-promo-bar) .header-habitat{position:fixed}}.page-template-instapage.summer-of-learning #header-habitat.events-header{display:none}@media screen and (min-width:979px){.page-template-instapage.summer-of-learning.persistent-header{padding-top:0}}@media screen and (min-width:1300px){.container{width:1280px}}@media screen and (min-width:1440px){.header-habitat .container{width:1440px;padding-left:10px}}@media screen and (min-width:1600px){.container{width:1280px}}.footer-habitat,.page-wrapper-on-load{visibility:hidden}.vwo-hide{display:none !important}.promo-sticky-header header.header-habitat{position:fixed}.promo-notification{position:relative;background-color:#243e56;color:white;width:100%;z-index:2}.promo-notification__elements{vertical-align:middle;display:inline-block;text-align:center}.promo-notification__elements p{margin:0;font-family:"myriad-pro",helvetica}.promo-notification__elements a{font-size:16px;color:white;text-decoration:underline;display:inline-block}.promo-notification__elements a:hover{color:#dedede}.promo-notification__actions{text-align:right;float:right;margin-right:20px;position:absolute;bottom:10px;right:0;background:transparent;border:0}.promo-notification__close{cursor:pointer}.promo-notification.promo-notification__v2{padding:10px 30px 9px;background-color:#004f80}.promo-notification.promo-notification__v2 .promo-

notification__actions{bottom:16px}@media screen and (min-width:767px){.promo-notification.promo-notification__v2 .promo-notification__elements a{padding:5px 11px;margin-left:8px;text-decoration:none;border-radius:3px;border:1px solid white}.promo-notification.promo-notification__v2 .promo-notification__elements a:hover{background-color:#0070f0;border-color:#0070f0;color:white}}@media screen and (max-width:767px){.promo-notification.promo-notification__v2 .promo-notification__elements a{font-weight:600}.promo-notification.promo-notification__v2 .promo-notification__elements a:hover{color:#009afa}}.promo-notification.promo-notification__v3{background-color:white;color:black;height:105px;padding:0 20px;background-repeat:no-repeat;background-position:right bottom}.promo-notification.promo-notification__v3 p{font-size:21px;font-weight:600;line-height:28px;font-family:"source-sans-pro",helvetica;padding:10px 0}.promo-notification__container{position:relative}.promo-notification__row{display:table;width:100%;margin:0 auto;height:105px}.promo-notification__row--cell{display:table-cell;vertical-align:middle}.promo-notification__logo{width:325px}.promo-notification__logo--img{width:100%;max-height:105px}.promo-notification__content{padding:10px}.promo-notification__cta{width:200px}.promo-notification__cta--btn{background-color:#140800;color:white;transition:.3s;border:2px solid #140800;max-height:42px;font-size:18px;line-height:21px;padding:8px 20px 10px;width:100%;max-width:200px;font-family:"source-sans-pro",helvetica}.promo-notification__cta--btn:hover{background-color:transparent;color:#140800}.promo-notification__widget-devider{padding:0 21px}.promo-notification__widget-icon{vertical-align:middle;margin-right:10px;margin-top:-3px}.promo-notification__widget-text{font-size:18px}.promo-notification.promo-notification__v4{background-color:#2d2859;color:white;height:105px;padding:0 20px;background-repeat:no-repeat;background-position:bottom center;background-size:contain}.promo-notification.promo-notification__v4 p{font-size:21px;font-weight:600;line-height:28px;font-family:"source-sans-pro",helvetica;padding:10px 0}.promo-notification.promo-notification__v4 .promo-notification__logo{width:175px;padding:0 0 15px}.promo-notification.promo-notification__v4 .promo-notification__logo--img{width:100%;max-height:100%}.promo-notification.promo-notification__v4 .promo-notification__cta{width:200px}.promo-notification.promo-notification__v4 .promo-notification__cta--btn{background-color:#ed0000;color:white;border:1px solid #ed0000;max-width:200px;padding:8px 20px 11px}.promo-notification.promo-notification__v4 .promo-notification__cta--btn:hover{background-color:#bd0101;color:white;border-color:#bd0101}@media screen and (min-width:1440px){.promo-notification .container{width:1440px;padding-left:10px}}@media screen and (max-width:1440px){.promo-notification .container{width:1440px;padding-left:10px}}@media screen and (max-width:1440px){.promo-notification .container{width:100%;padding-left:10px}}@media screen and (max-width:1200px){.promo-notification.promo-notification__v3 p{font-size:18px}.promo-notification.promo-notification__v4 p{font-size:16px}.promo-notification__logo{width:235px}.promo-notification.promo-notification__v4 .promo-notification__cta,.promo-notification__cta{width:160px}.promo-notification__widget-devider{padding:0 10px}.promo-notification__widget-text{font-size:16px}.promo-notification.promo-notification__v4 .promo-notification__logo{width:140px;padding:0 0 5px}.promo-notification.promo-

notification__v4 .promo-notification__content{padding:10px 0}}@media screen and (min-width:1200px) and (max-width:1280px){.promo-notification.promo-notification__v4 p{font-size:20px}.promo-notification.promo-notification__v4 .promo-notification__cta{width:176px}.promo-notification.promo-notification__v4 .promo-notification__widget-devider{padding:0 10px}}@media screen and (min-width:980px) and (max-width:1000px){.promo-notification.promo-notification__v4 p{font-size:15px}}@media screen and (max-width:1024px){.promo-notification__logo{width:200px}}@media screen and (max-width:979px){.promo-notification.promo-notification__v3,.promo-notification.promo-notification__v4{height:auto;background-image:none !important}.promo-notification.promo-notification__v3 p,.promo-notification.promo-notification__v4 p{font-size:16px;font-weight:400}.promo-notification .container{padding-left:0}.promo-notification__row{height:auto;padding-bottom:20px}.promo-notification__row--cell{display:block;padding-bottom:0}.promo-notification__logo{display:none}.promo-notification__cta{display:table;margin:0 auto;width:auto}.promo-notification__cta--link{color:black;font-size:16px;font-weight:400;text-decoration:underline}.promo-notification__cta--link:hover{color:black}.promo-notification.promo-notification__v4 .promo-notification__cta{width:auto}.promo-notification.promo-notification__v4 .promo-notification__cta--link{color:#ff5c5c}.promo-notification.promo-notification__v4 .promo-notification__cta--link:hover{color:#ff5c5c}.promo-notification.promo-notification__v4 .promo-notification__content{padding-bottom:0}.promo-notification__widget-text{font-size:16px;font-weight:400}}@media screen and (max-width:639px){.promo-notification{padding:21px}.promo-notification__actions{top:10px;right:10px;line-height:0;padding-right:0}.promo-notification__elements a{display:block}}@media screen and (min-width:1920px){.promo-notification.promo-notification__v4{background-size:cover}}@media screen and (min-width:1600px){.promo-notification.promo-notification__v4 .container{padding-left:20px}}@media screen and (max-width:639px){.lte9 .primary-menu-container li>a{border-bottom-color:#2a3946}.lte9 .dropdown-menu{border:1px solid;border-color:#dedede}}.header-habitat .dropdown-menu{border:1px solid;border-color:#dedede}.header-habitat .bs-collapse-toggle{display:none}@media screen and (max-width:979px){.header-habitat .bs-collapse-toggle{display:block}}.header-habitat .account-down-caret{display:inline-block;width:11px;height:11px;position:relative;top:4px;right:-1px;background-position:-14px -215px}@media screen and (max-width:979px){.header-habitat .account-down-caret{background:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/sprites/general_icons.png") no-repeat}}@media(-webkit-min-device-pixel-ratio:2),(min-resolution:192dpi){.header-habitat .account-down-caret{background-size:365px 245px}}@media screen and (-webkit-min-device-pixel-ratio:2) and (max-width:979px),screen and (min-resolution:192dpi) and (max-width:979px){.header-habitat .account-down-caret{background-image:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/sprites/general_icons@2x.png")}}.header-habitat .dropdown-holder svg{fill:#fff}.header-habitat .dropdown-holder .account-down-caret{background-position:-54px -215px}.header-habitat .dropdown-holder.active .account-down-caret{background-position:-254px -135px}.header-habitat .dropdown-holder.active svg{fill:#42a9ff}.header-habitat .dropdown-

holder.active .dropdown-toggle{color:#42a9ff}.header-habitat .dropdown-holder:hover svg{fill:#42a9ff}.header-habitat .dropdown-holder a.active{color:white}.header-habitat .dropdown-holder a.active .account-down-caret{background-position:-54px -215px}.header-habitat .dropdown-holder a.active:before{opacity:1}.header-habitat .dropdown-holder a.active svg{fill:#fff}.header-habitat .dropdown-toggle{background:transparent;border:0;color:#fff;font-family:"source-sans-pro",helvetica;font-size:16px;line-height:21px;border-radius:0;padding:22px 20px 20px 19px}@media screen and (min-width:1095px){.header-habitat .dropdown-toggle{padding:22px 28px 20px}}.header-habitat .dropdown-toggle:hover{color:#42a9ff}@media screen and (max-width:979px){.header-habitat .dropdown-toggle-mobile{padding-top:16px;padding-bottom:12px;padding-left:0;width:100%;text-align:left;background:transparent;border:0;color:#fff;font-family:"source-sans-pro",helvetica;font-size:16px;line-height:21px}.header-habitat .dropdown-toggle-mobile:hover{color:#42a9ff}}.header-habitat .product-nav{float:right;margin-right:197px;position:relative;z-index:5}.header-habitat .product-nav .product-menu{position:relative;top:0}.header-habitat .product-nav .product-menu a{color:#fff;display:inline-block}.header-habitat .product-nav .product-menu>li>a{font-size:16px;padding:22px 20px 20px 19px}@media screen and (min-width:1095px){.header-habitat .product-nav .product-menu>li>a{padding:22px 28px 20px}}.header-habitat .product-nav .product-menu .header__product-name{font-size:21px;color:white;padding:21px 0}.header-habitat .product-nav .product-menu .product-menu-dropdown{width:780px;left:-38px}.header-habitat .product-nav .product-menu .product-menu-dropdown:before{left:120px}.header-habitat .product-nav .product-menu .product-menu-dropdown:after{content:"";position:absolute;width:17%;height:100%;right:0;top:0;background-color:#f7f7f7;z-index:-1}.header-habitat .product-nav .product-menu .product-menu-dropdown .integ-link{border-top:1px solid #ededed}.header-habitat .product-nav .product-menu .product-menu-dropdown .integ-link p{margin:0;padding-top:10px;font-size:14px;text-align:left}.header-habitat .product-nav .product-menu .product-menu-dropdown .btn-badge{margin-left:3px;background-color:#0070f0}@media screen and (min-width:979px){.header-habitat .product-nav .product-menu .product-menu-dropdown{left:-160px}.header-habitat .product-nav .product-menu .product-menu-dropdown:before{left:250px}}@media screen and (max-width:1095px){.header-habitat .product-nav .product-menu .product-menu-dropdown:before{left:242px}}@media screen and (min-width:1095px){.header-habitat .product-nav{margin-right:210px}}@media screen and (min-width:979px){.header-habitat .product-nav{padding-right:20px}.header-habitat .product-nav__vwo-exp{float:left}}.header-habitat .product-nav .dropdown-menu{display:none;position:absolute;top:55px;right:-9px;padding-left:0;background-color:white;border-radius:3px;font-size:14px;z-index:3;left:auto;padding-bottom:0;box-shadow:0 4px 13px 0 rgba(0,0,0,0.3);border:1px solid;border-color:#dedede}.header-habitat .product-nav .dropdown-menu.active{display:block}.header-habitat .product-nav .dropdown-menu:before{content:"";width:0;height:0;border-left:7px solid transparent;border-right:7px solid transparent;border-bottom:7px solid;border-bottom-color:white;position:absolute;top:-6px;right:10px}.header-habitat .product-nav .dropdown-menu li{overflow:visible}.header-habitat .product-nav .dropdown-menu.dropdown-menu-left:before{right:auto;left:10px}.header-habitat .product-nav .dropdown-menu.dropdown-menu-none:before{display:none}.header-habitat .product-

nav .dropdown-menu.dropdown-menu-push{top:68px}.header-habitat .product-nav .dropdown-menu a{padding:5px 10px;display:block;text-align:left;color:#333}.header-habitat .product-nav .dropdown-menu a:hover{color:#0070f0;background-color:transparent !important}.header-habitat .product-nav .dropdown-menu .dropdown-section{text-align:left;padding-bottom:10px;box-sizing:border-box;font-size:16px}.header-habitat .product-nav .dropdown-menu .dropdown-section.tools .section-head-new svg{content:"";display:inline-block;width:10px;height:10px;margin-left:-9px;margin-right:5px}.header-habitat .product-nav .dropdown-menu .dropdown-section.tools .section-head-new .product-type{font-weight:600}.header-habitat .product-nav .dropdown-menu .dropdown-section .section-head{padding:16px 0 12px 10px;font-weight:600;position:relative;margin-left:-9px}.header-habitat .product-nav .dropdown-menu .dropdown-section .section-head .product-type{border-bottom:1px solid #dedede;padding-bottom:5px;padding-right:5px;font-size:14px;color:#787878;font-weight:400}.header-habitat .product-nav .dropdown-menu .dropdown-section a{text-align:left;border-bottom:0}.header-habitat .primary-menu-container{position:absolute;z-index:3;right:0;padding-right:20px}.header-habitat .primary-menu-container .primary-menu a{color:#fff;display:inline-block}.header-habitat .primary-menu-container .primary-menu .btn-badge{line-height:18px;margin-right:10px;color:white;margin-top:-5px;vertical-align:middle;background:#009cfc}.header-habitat .primary-menu-container .primary-menu li{font-family:"source-sans-pro",helvetica}.header-habitat .primary-menu-container .primary-menu li.contact-us-link{margin-left:5px;text-transform:uppercase}@media screen and (min-width:1095px){.header-habitat .primary-menu-container .primary-menu li.contact-us-link{margin-left:23px}}.header-habitat .primary-menu-container .primary-menu li.contact-us-link a{color:white;font-weight:400;padding:5px 15px}.header-habitat .primary-menu-container .primary-menu li.contact-us-link a:hover{background-color:#0070f0;border-color:#0070f0}.header-habitat .primary-menu-container .primary-menu li.free-trial-link{margin-left:5px;text-transform:uppercase}@media screen and (min-width:1095px){.header-habitat .primary-menu-container .primary-menu li.free-trial-link{margin-left:23px}}.header-habitat .primary-menu-container .primary-menu li.free-trial-link a{color:white;font-weight:400;padding:5px 15px}.header-habitat .primary-menu-container .primary-menu li.free-trial-link a:hover{background-color:#009afa;border-color:#009afa}.header-habitat .primary-menu-container .primary-menu li.free-trial-btn{margin-left:5px;text-transform:uppercase}@media screen and (min-width:1095px){.header-habitat .primary-menu-container .primary-menu li.free-trial-btn{margin-left:23px}}.header-habitat .primary-menu-container .primary-menu li.free-trial-btn a{font-weight:400;padding:5px 15px}.header-habitat .primary-menu-container .primary-menu li.free-trial-btn a:hover{color:#fff;border-color:#0070f0;background:#0070f0}.header-habitat .primary-menu-container .primary-menu li.sign-in-link{position:relative}.header-habitat .primary-menu,.header-habitat .product-menu{font-weight:400}.header-habitat .primary-menu li.active a,.header-habitat .primary-menu li:hover a,.header-habitat .product-menu li.active a,.header-habitat .product-menu li:hover a{color:#42a9ff}.header-habitat .primary-menu li.active .integ-link a,.header-habitat .primary-menu li:hover .integ-link a,.header-habitat .product-menu li.active .integ-link a,.header-habitat .product-menu li:hover .integ-link a{color:#333}.header-habitat .primary-menu li.active li a,.header-habitat .primary-menu li:hover li a,.header-habitat .product-menu li.active li a,.header-habitat .product-menu li:hover li a{color:#333}.header-

habitat .primary-menu li li a.sign_out_link,.header-habitat .product-menu li li a.sign_out_link{color:#de1421}.header-habitat .primary-menu li>a,.header-habitat .product-menu li>a{font-family:"source-sans-pro",helvetica;font-weight:400}.header-habitat .primary-menu li>a:hover .caret:after,.header-habitat .product-menu li>a:hover .caret:after{background-position:-250px -88px}.header-habitat .primary-menu>li,.header-habitat .product-menu>li{position:relative}.header-habitat .primary-menu>li>a,.header-habitat .product-menu>li>a{padding:21px 10px;font-size:16px}.header-habitat .primary-menu>li>a.doc-menu-toggle,.header-habitat .product-menu>li>a.doc-menu-toggle{padding-bottom:16px}.header-habitat .product-nav .dropdown-menu{right:0;left:auto}.header-habitat .product-nav .dropdown-menu a{border-bottom:0;text-align:left;font-size:16px}.header-habitat .product-nav .small-dropdown-menu{width:192px;padding:5px 0}.header-habitat .product-nav .small-dropdown-menu li{padding:0 10px}.header-habitat .product-nav .developers-dropdown-menu,.header-habitat .product-nav .solutions-dropdown-menu{right:12px}.header-habitat .product-nav .solutions-dropdown-menu{width:240px}.header-habitat .product-nav .developers-dropdown-menu__item .btn-badge{margin-left:6px}@media screen and (max-width:1440px){.header-habitat .container{width:100%;padding-left:10px}}.header-habitat--hidden{display:none}#product-menu-dropdown{padding:0 0 10px 5px;font-family:"source-sans-pro",helvetica}#product-menu-dropdown .tools{font-size:14px;color:#787878;padding:5px 10px}#product-menu-dropdown a{padding:10px 10px}#product-menu-dropdown a .dropdown-link-text{font-size:14px;color:#787878}#product-menu-dropdown a .dropdown-link-heading{font-weight:600}#product-menu-dropdown a:hover{color:#0070f0;background-color:transparent !important}#product-menu-dropdown a:hover .dropdown-link-text{color:#0070f0}#product-menu-dropdown a:focus{outline:auto;outline-offset:inherit}#product-menu-dropdown a .menu-icon-holder{float:left;margin-right:11px;margin-top:3px;width:36px;text-align:right}#product-menu-dropdown a .menu-icon-holder.menu-icon-app-automate,#product-menu-dropdown a .menu-icon-holder.menu-icon-app-live{width:32px}#product-menu-dropdown a .menu-icon-holder svg{width:auto;height:34px}#product-menu-dropdown .integ-link a{font-size:14px;display:inline;padding-left:0}@media screen and (min-width:979px){.persistent-header .free-trial-link>.persistent-header-primary{background-color:#0070f0;border-color:#143452;transition:all 250ms ease 0s}}@media screen and (max-width:979px){.persistent-header.persistent-top .header-habitat{position:fixed}.persistent-header.persistent-up .header-habitat{position:fixed;transition:top .4s}.persistent-header.persistent-down .header-habitat{position:fixed;transition:top .4s}.header-habitat .account-ahead-caret{display:inline-block;width:11px;height:11px;position:relative;top:4px;right:-1px;background-position:-14px -215px;height:20px;background-position:-258px -172px !important;top:7px;right:-10px}}@media screen and (max-width:979px) and (max-width:979px){.header-habitat .account-ahead-caret{background:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/sprites/general_icons.png") no-repeat}}@media screen and (max-width:979px) and (-webkit-min-device-pixel-ratio:2),screen and (max-width:979px) and (min-resolution:192dpi){.header-habitat .account-ahead-caret{background-size:365px 245px}}@media screen and (max-width:979px) and (-webkit-min-device-pixel-ratio:2) and (max-width:979px),screen and (max-width:979px) and (min-resolution:192dpi) and (max-width:979px){.header-habitat .account-ahead-caret{background-

image:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/sprites/general_icons@2x.png")}}@media screen and (max-width:979px){.header-habitat .account-behind-caret{display:inline-block;width:11px;height:11px;position:relative;top:4px;right:-1px;background-position:-14px -215px}}@media screen and (max-width:979px) and (max-width:979px){.header-habitat .account-behind-caret{background:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/sprites/general_icons.png") no-repeat}}@media screen and (max-width:979px) and (-webkit-min-device-pixel-ratio:2),screen and (max-width:979px) and (min-resolution:192dpi){.header-habitat .account-behind-caret{background-size:365px 245px}}@media screen and (max-width:979px) and (-webkit-min-device-pixel-ratio:2) and (max-width:979px),screen and (max-width:979px) and (min-resolution:192dpi) and (max-width:979px){.header-habitat .account-behind-caret{background-image:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/sprites/general_icons@2x.png")}}@media screen and (max-width:979px){.header-habitat .account-behind-caret{height:18px;background-position:-175px -171px;top:21px;left:25px;position:absolute}.header-habitat .container{padding-left:0}.header-habitat .bs-collapse{display:none}.header-habitat .bs-collapse.active{display:block}.header-habitat .bs-collapse-toggle{position:relative;z-index:3;padding:23px 0 22px;background:transparent;border:0;min-width:24px}.header-habitat .bs-collapse-toggle svg{display:none}.header-habitat .bs-collapse-toggle svg:first-child{display:block}.header-habitat .bs-collapse-toggle:hover{color:white}.header-habitat .bs-collapse-toggle.active svg{display:block;margin:0 auto}.header-habitat .bs-collapse-toggle.active svg:first-child{display:none}.header-habitat .primary-menu-container,.header-habitat .product-nav{padding:0;width:100%;left:0;top:63px;background-color:#142433}.header-habitat .primary-menu-container li,.header-habitat .product-nav li{display:block;padding-left:21px}.header-habitat .primary-menu-container li>a,.header-habitat .product-nav li>a{padding-top:16px;padding-bottom:12px;padding-left:0;display:block;width:100%}.header-habitat .primary-menu-container .primary-menu,.header-habitat .product-nav .primary-menu{float:none}.header-habitat .primary-menu-container .primary-menu.active,.header-habitat .product-nav .primary-menu.active{min-height:calc(100vh - 63px)}.header-habitat .primary-menu-container .primary-menu li,.header-habitat .product-nav .primary-menu li{border-bottom:1px solid;border-bottom-color:rgba(255,255,255,0.1)}.header-habitat .primary-menu-container .primary-menu li.free-trial-link,.header-habitat .product-nav .primary-menu li.free-trial-link{margin-left:0}.header-habitat .primary-menu-container .primary-menu li.free-trial-link a,.header-habitat .product-nav .primary-menu li.free-trial-link a{padding:15px 6px 14px 0}.header-habitat .primary-menu-container .primary-menu li.free-trial-link a.btn-secondary-white.btn-md,.header-habitat .product-nav .primary-menu li.free-trial-link a.btn-secondary-white.btn-md{text-align:left;border:0}.header-habitat .primary-menu-container .primary-menu li.free-trial-link a.btn-secondary-white.btn-md:hover,.header-habitat .product-nav .primary-menu li.free-trial-link a.btn-secondary-white.btn-md:hover{color:#009cfc;background-color:transparent}.header-habitat .primary-menu-container .section-head,.header-habitat .product-nav .section-head{border-bottom:1px solid;border-bottom-color:rgba(255,255,255,0.1)}.header-habitat .primary-menu-

container .mobile-dropdown-menu li,.header-habitat .product-nav .mobile-dropdown-menu li{color:white;font-weight:400;line-height:21px;font-family:"source-sans-pro",helvetica}.header-habitat .primary-menu-container .mobile-dropdown-menu li>a,.header-habitat .product-nav .mobile-dropdown-menu li>a{padding:16px 16px 12px 0;color:white}.header-habitat .dropdown-section{min-height:calc(100vh - 63px);margin:0}.header-habitat .dropdown-section .section-head{padding:28px 0 12px 21px;font-weight:400}.header-habitat .dropdown-section .section-head .product-type{padding-bottom:5px;padding-right:5px;font-size:14px;color:#999;font-weight:400;border:0}.header-habitat .dropdown-section .section-title{padding:16px 0 12px 21px}.header-habitat .dropdown-section .section-title.back{background-color:#142433;padding-left:42px;cursor:pointer}.header-habitat .dropdown-section .section-title .cta{border:0;font-family:"source-sans-pro",helvetica;color:#fff;background:transparent;width:100%;text-align:left;padding-top:0;padding-bottom:0;padding-left:25px;height:30px;margin-left:-20px}.header-habitat .primary-menu-container .dropdown-section{text-align:left;padding-bottom:10px;box-sizing:border-box;font-size:16px}.header-habitat .primary-menu-container .dropdown-section a{text-align:left;border-bottom:0}.header-habitat .product-menu li .product,.header-habitat .product-menu li .product-dropdown-toggle{padding:22px 5px 14px}}@media screen and (max-width:1024px) and (min-width:980px){.header-habitat .product-nav .developers-dropdown-menu{right:3px}}.free-trial-btn.go-to-dashboard{display:none}@media screen and (min-width:980px){body.wp-signed-state .sign-in-link,body.wp-signed-state .free-trial-btn{display:none}body.wp-signed-state .go-to-dashboard{display:inline-block}body.wp-signed-state .hero-unit--v2 .btn-started-wrapper a,body.wp-signed-state .hero-unit--v2 .btn-secondary-demo-wrapper button,body.wp-signed-state .hero-unit--product-wrapper .btn-started-wrapper a,body.wp-signed-state .hero-unit--product-wrapper .btn-secondary-demo-wrapper button{display:none}body.wp-signed-state .hero-unit--v2 .btn-contact-wrapper a,body.wp-signed-state .hero-unit--v2 .free_trial_csf_variation,body.wp-signed-state .hero-unit--product-wrapper .btn-contact-wrapper a,body.wp-signed-state .hero-unit--product-wrapper .free_trial_csf_variation{display:inline-block !important}}@media screen and (min-width:980px){body.wp-signed-state.docs-search-auth-user .header-habitat .product-nav{margin-right:245px}}.header-habitat .product-nav #product-menu-dropdown .section-head__icon-holder{display:none}.header-habitat .product-nav #product-menu-dropdown .integration-wrapper{display:none}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation{box-shadow:0 50px 100px -20px rgba(50,50,93,0.25),0 30px 60px -30px rgba(0,0,0,0.3);border-color:white;border-radius:6px;padding:0;width:800px;top:58px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation::before{border-left:8px solid transparent;border-right:8px solid transparent;border-bottom:8px solid white;top:-8px;left:248px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation::after{width:30%;background-color:#f3faff;height:calc(100% - 54px);border-top-right-radius:6px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper{padding:15px 0;display:block;border-top:1px solid #dedede}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper .integration-xs-8{width:70%;float:left;text-align:left;padding-left:32px;padding-right:32px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper .integration-xs-4{float:left;text-align:left;width:30%}.header-habitat .product-nav #product-

menu-dropdown.product-menu-variation .integration-wrapper__desc{display:inline-block;vertical-align:middle;text-align:left;font-size:14px;font-weight:600;line-height:21px;color:#333;margin:0}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper__list{padding-left:12px;display:inline-block;vertical-align:middle}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper__list-icon{display:inline-block;vertical-align:middle;margin-right:12px;padding:0}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper__list-icon:last-child{margin-right:0}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper__list-icon svg{vertical-align:middle}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper__info{font-size:14px;font-weight:600;line-height:21px;color:#333}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper__info span{display:inline-block;vertical-align:middle}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper__info-link{font-size:14px;font-weight:600;color:black;display:inline-block;vertical-align:top;padding:0}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper__info-link span:first-child{text-decoration:underline;margin:0 3px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper__info-link span:last-child{font-size:12px;line-height:12px;vertical-align:text-bottom}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .integration-wrapper__info-link:hover{color:#0070f0}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-8{width:70%;padding-left:20px;padding-right:20px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-8 .dropdown-section{width:50%;padding-left:0;padding-right:0}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-8 .dropdown-section:first-child{padding-right:20px;padding-bottom:12px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-8 .dropdown-section li a{padding:12px 12px;margin-bottom:15px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-8 .dropdown-section li a .dropdown-link-heading{font-weight:700;color:black;font-size:18px;line-height:21px;margin-bottom:3px;letter-spacing:.5px;text-transform:uppercase;position:relative}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-8 .dropdown-section li a .dropdown-link-heading .btn-badge{position:absolute;top:2px;left:60px;line-height:14px;margin-left:0;background-color:#0070f0}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-8 .dropdown-section li a .dropdown-link-text{font-weight:400;color:#65737e;font-size:14px;line-height:21px;letter-spacing:.2px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-8 .dropdown-section li a:hover{background-color:rgba(224,242,255,0.7) !important;border-radius:4px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-8 .dropdown-section li a:hover .dropdown-link-heading{color:#0067dd}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-8 .dropdown-section li a:hover .dropdown-link-text{color:#004b8f}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-8 .integ-link{display:none}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-xs-4{width:30%;padding-

left:20px;padding-right:20px;padding-bottom:21px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .dropdown-section.tools{padding:0}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .dropdown-section.tools li{padding-top:21px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .dropdown-section.tools li.section-head-new{padding-bottom:5px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .dropdown-section.tools li.tools-section-head{padding-top:40px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .dropdown-section.tools li a{color:#333;font-weight:600;font-size:16px;line-height:21px;padding:0 12px;display:inline-block}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .dropdown-section.tools li a:hover{color:#0070f0}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .menu-icon-holder{display:none}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .section-head{padding:21px 12px 15px;margin-left:0}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .section-head::after{content:'';position:absolute;bottom:9px;left:12px;width:70%;height:1px;background-color:#dedede}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .section-head-new::after{width:88%;bottom:-1px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .section-head__icon-holder{display:inline-block;margin-right:10px}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .section-head__icon-holder svg{fill:none;width:auto;height:auto;margin-left:0;margin-right:0;display:inline-block;vertical-align:middle}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .section-head__control-icon{display:none}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .section-head__tools-icon svg{fill:black}.header-habitat .product-nav #product-menu-dropdown.product-menu-variation .section-head .product-type{border-bottom:0;padding-bottom:0;padding-right:0;font-size:12px;line-height:15px;color:#333;font-weight:600;text-transform:uppercase;display:inline-block;vertical-align:middle}@media screen and (max-width:1095px){.header-habitat .product-nav #product-menu-dropdown.product-menu-variation::before{left:240px}}.header-habitat .product-nav .developers-menu-exp{display:none}.header-habitat .product-nav .developers-menu-variation{box-shadow:0 50px 100px -20px rgba(50,50,93,0.25),0 30px 60px -30px rgba(0,0,0,0.3);border-color:white;border-radius:6px;padding:21px 20px;width:900px;top:58px;right:-437px}.header-habitat .product-nav .developers-menu-variation::before{right:50%;-ms-transform:translateX(-50%);transform:translateX(-50%);border-left:8px solid transparent;border-right:8px solid transparent;border-bottom:8px solid white;top:-8px}.header-habitat .product-nav .developers-menu-variation .developers-menu-control{display:none}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp{display:block;padding:0 12px}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp:first-child{padding-right:30px}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__main{padding:0;margin:0}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__left-item{padding:15px 0;border-bottom:1px solid #dedede}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__left-item:first-

child{padding-top:12px}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__left-item a{padding:0;display:inline-block;vertical-align:top;font-weight:600;color:#004b8f;font-size:18px;line-height:21px;letter-spacing:.5px}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__left-item a:hover{color:#0070f0}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__left-item:last-child{border-bottom:0}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__list{padding:0}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__list-item{padding:12px 12px;margin-bottom:15px}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__list-item .dropdown-link__heading{font-weight:700;color:black;font-size:18px;line-height:21px;margin-bottom:3px;letter-spacing:.5px;display:block;position:relative;text-transform:uppercase}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__list-item .dropdown-link__heading .btn-badge{position:absolute;top:2px;left:152px;line-height:14px;background-color:#0070f0}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__list-item .dropdown-link__text{font-weight:400;color:#65737e;font-size:14px;line-height:21px;letter-spacing:.2px;display:block}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__list-item:hover{background-color:rgba(224,242,255,0.7) !important;border-radius:4px}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__list-item:hover .dropdown-link__heading{color:#0067dd}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__list-item:hover .dropdown-link__text{color:#004b8f}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__list:last-child a{margin-bottom:5px}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__submenu{clear:both}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__submenu .dropdown-link__main{width:calc(50% - 20px);float:left;margin-right:40px}.header-habitat .product-nav .developers-menu-variation .developers-menu-exp__main .dropdown-link__submenu .dropdown-link__main:last-child{margin-right:0}.header-habitat .product-nav .developers-menu-variation .section-head{position:relative;padding-bottom:15px}.header-habitat .product-nav .developers-menu-variation .section-head::after{content:'';position:absolute;bottom:9px;left:0;width:100%;height:1px;background-color:#dedede}.header-habitat .product-nav .developers-menu-variation .section-head--resource-head{padding-left:12px}.header-habitat .product-nav .developers-menu-variation .section-head--resource-head::after{left:12px;width:calc(100% - 12px)}.header-habitat .product-nav .developers-menu-variation .section-head__icon-holder{display:inline-block;margin-right:10px}.header-habitat .product-nav .developers-menu-variation .section-head__icon-holder svg{fill:none;width:auto;height:auto;margin-left:0;margin-right:0;display:inline-block;vertical-align:middle}.header-habitat .product-nav .developers-menu-variation .section-head__icon-text{border-bottom:0;padding-bottom:0;padding-right:0;font-size:12px;line-height:15px;color:#333;font-weight:600;text-transform:uppercase;display:inline-block;vertical-align:middle}@media screen and (max-width:1095px){.header-

habitat .product-nav .developers-menu-variation{right:-467px}.header-habitat .product-nav .developers-menu-variation::before{right:52.5%}}html.doc-search-enabled{overflow:hidden !important}.header-habitat .primary-menu-container .primary-menu .doc-menu-toggle.hide,.header-habitat .doc-menu-toggle.hide{display:none}@media all and (-ms-high-contrast:none),(-ms-high-contrast:active){.header-habitat .primary-menu-container .primary-menu .doc-menu-toggle,.header-habitat .doc-menu-toggle{display:none}}.header-habitat .doc-search-menu{margin-left:15px;background:transparent;border:0;padding:21px 10px;height:63px}.header-habitat .doc-search-menu:before{content:"";position:relative;vertical-align:text-top;display:inline-block;background:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/docs-search/ic-search.svg") no-repeat;background-position:center;background-size:contain;width:26px;height:25px;margin-right:8px}.header-habitat .doc-search-menu:hover:before{background:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/docs-search/ic-search-blue.svg") no-repeat;width:26px;height:25px;background-position:center;background-size:contain}.dropdown-holder.icon-only .nav_item_name{display:none}@media screen and (min-width:979px){body.docs-search-auth-user .header-habitat .product-nav{margin-right:260px}}@media screen and (min-width:1095px){body.docs-search-auth-user .header-habitat .product-nav{margin-right:290px}}@media screen and (min-width:979px){body.docs-search-auth-user .header-habitat .product-nav.product-nav-without-signin{margin-right:60px}}@media screen and (min-width:1095px){body.docs-search-auth-user .header-habitat .product-nav.product-nav-without-signin{margin-right:60px}}@media screen and (min-width:979px) and (max-width:1024px){body.docs-search-auth-user .header-habitat .product-nav.product-nav-without-signin .product-menu .product-menu-dropdown{left:-230px}body.docs-search-auth-user .header-habitat .product-nav.product-nav-without-signin .product-menu .product-menu-dropdown:before{left:310px}body.docs-search-auth-user .header-habitat .product-nav.product-nav-without-signin .product-menu .developers-dropdown-menu{right:2px}}.ds__container{position:fixed;background:rgba(0,0,0,0.25);top:63px;left:0;right:0;bottom:0;z-index:3;visibility:hidden;opacity:0}.ds__container.show-doc{visibility:visible;opacity:1}.ds__container .container{position:relative}.ds__overlay{position:fixed;top:63px;left:0;right:0;bottom:0;z-index:0;background:transparent;opacity:0}.ds__top-bar{min-height:63px;background:white;padding:14px;position:relative}.ds__input__container{width:100%;max-width:940px;margin:0 auto;position:relative}.ds__input__container:before{background:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/docs-search/ic-search-grey.svg") no-repeat;background-position:center;background-size:contain;content:"";width:30px;height:30px;position:absolute;left:15px;top:calc(50% - 15px)}.ds__input__container.input-box-focused:before{background:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/docs-search/ic-search-dark-blue.svg") no-repeat;background-position:center;background-size:contain;content:"";width:30px;height:30px;position:absolute;left:15px;top:calc(50% - 15px)}.ds__input__container.input-box-focused input{border:solid 2px #0070f0}.ds__input__container input{border-radius:3px;border:solid 2px

#999;width:100%;padding:13px 56px 15px;box-sizing:border-box;font-size:16px;line-height:1.31;font-family:"source-sans-pro",helvetica;-webkit-appearance:none;-webkit-border-radius:3px}.ds__input__container input:focus{outline:0}.ds__input__container input::-webkit-input-placeholder{color:#999}.ds__input__container input:-ms-input-placeholder{color:#999}.ds__input__container input::placeholder{color:#999}.ds__input--clear{position:absolute;right:15px;top:12px;font-size:30px;cursor:pointer;color:transparent}.ds__input__handle{display:inline-block;position:absolute;right:17px;height:100%;display:-ms-flexbox;display:flex;-ms-flex-align:center;align-items:center;top:0}.ds__input__handle--btn{cursor:pointer;border:0;background-position:center;background-size:contain}.ds__input__handle--btn:hover{opacity:1}.ds__input__handle--btn__clear-image{width:20px}.ds__input__handle--reset{margin-top:5px;margin-right:16px;background:transparent;padding:0}.ds__input__handle--submit{top:calc(50% - 12px);background:#e3f3fc;font-size:16px;padding:7px;font-weight:normal;border-radius:3px;padding:2px 29px 3px 7px;color:#0070f0}.ds__input__handle--submit::after{background:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/docs-search/ic-keyboard-return.svg") no-repeat;background-position:center;background-size:contain;content:"";width:18px;height:18px;position:absolute;right:5px;top:calc(50% - 7px)}.ds__input__handle.hide{display:none}.ds--close{position:absolute;right:20px;font-size:30px;color:#333;top:calc(50% - 15px);cursor:pointer;opacity:.7;background:url("https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/docs-search/ic-clear.svg") no-repeat;width:30px;height:30px;background-position:center;background-size:contain;border:0;padding:0}.ds--close:hover{opacity:1}@media screen and (min-width:1441px){.ds--close{right:35px}}.ds__top-bar .container{max-width:100%;margin:0 auto}@media screen and (min-width:1440px){.ds__top-bar .container{width:1440px}}@media screen and (max-width:1440px){.ds__top-bar .container{width:100%}}@media screen and (max-width:1080px){.ds__input__container,.ds__dropdown__container{max-width:600px}}@media screen and (max-width:767px){.ds__input__container{width:100%;max-width:calc(100% - 100px);margin:0}}.doc-search-mobile-cta{display:none}@media screen and (max-width:979px){.doc-search-mobile-cta{display:block;position:absolute;top:0;right:44px;cursor:pointer;background:transparent;padding:20px 10px 14px 6px;border:0}.doc-search-mobile-cta svg{height:25px}.header-habitat.doc-search{position:relative}.ds__input__container{width:95%;margin:0;max-width:none}.ds__input__container input[type="search"]{padding:13px 56px 15px 12px}.ds__input__container::before{background:0;width:0}.ds__input__container .input-box-focused::before{background:0;width:0}.ds--close{right:0}}@media screen and (max-width:960px){.all-search .ds__top-bar .container{padding:0 15px}.all-search .ds__dropdown__container{padding:0 15px}}@media screen and (max-width:768px){.ds__input__container{width:90%}}</style> <script type="text/javascript" async="" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/src/js/libraries/amplitude-4.1.1-min.gz.js" integrity="sha384-gVL16rLDmm6uCxO2ILZgcmC1dJ1xI20Vfxjywd5dZL8srL1GJsf1mN66MwmO4WWn" crossorigin="anonymous"></script><script type="text/javascript" async="" src="https://static.ads-twitter.com/uwt.js"></script><script defer=""

src="//www.google-analytics.com/analytics.js"></script><script defer="" src="https://www.googletagmanager.com/gtm.js?id=GTM-KX7NTRZ&gtm_auth=6u6X4YDLegPVQK8iBE4Bpg&gtm_preview=env-37&gtm_cookies_win=x"></script><script type="text/javascript">
function getCookieVal(e){for(var t=e.trim()
+"=",a=document.cookie.split(";"),i=0;i<a.length;i++){for(var s=a[i];"
"==s.charAt(0);)s=s.substring(1,s.length);if(0===s.indexOf(t))return
s.substring(t.length,s.length)}return null}var
bs_user_details=bs_user_details_obj="",updateHeaderCTA=vwoShowSignInState
=vwoDemoChatSignOutState=vwoDemoChatSignInState=!
1;if(getCookieVal("bs_logging_id"))try{if(getCookieVal("bs_user_details"))
{bs_user_details=getCookieVal("bs_user_details");var
u_detail=JSON.parse(bs_user_details);u_detail&&"object"==typeof
u_detail&&void 0!
==u_detail.plan_details&&(bs_user_details_obj=u_detail)}}catch(error){}
(bs_user_details.indexOf('live_testing":{"type":"Trial"}')!==-
1&&bs_user_details.indexOf('automate":{"type":"Trial"}')!==-
1&&bs_user_details.indexOf('app_live_testing":{"type":"Trial"}')!==-
1&&bs_user_details.indexOf('app_automate":{"type":"Trial"}')!==-
1&&bs_user_details.indexOf('percy":{"type":"Trial"}')!==-1&&null!
==getCookieVal("bs_logging_id")||bs_user_details.indexOf('live_testing":
{"type":"Extended Trial"}')!==-1&&bs_user_details.indexOf('automate":
{"type":"Extended Trial"}')!==-1&&bs_user_details.indexOf('app_live_testing":
{"type":"Extended Trial"}')!==-1&&bs_user_details.indexOf('app_automate":
{"type":"Extended Trial"}')!==-1&&bs_user_details.indexOf('percy":
{"type":"Extended Trial"}')!==-1&&null!
==getCookieVal("bs_logging_id"))&&(vwoShowSignInState=!0);try{var
freshChatLocalVal=localStorage.getItem("set_freshchat_state");freshChatLocalVa
l&&(new
Date).getTime()>JSON.parse(freshChatLocalVal)&&localStorage.removeItem("set
_freshchat_state")}catch(e){}
</script> <link onload="this.media == 'none'?this.media='all':''" rel="stylesheet" href="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/cache/css/bstack_f785356b115163ca038a5e7919c3827d.css?v=1659001287" media="all"><noscript><link rel="stylesheet" href="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/cache/css/bstack_f785356b115163ca038a5e7919c3827d.css?v=1659001287" media="all"/></noscript><script id="bstack_preload_css" type="text/javascript">
/** Objects and variables defined so they are always defined when required */
var BrowserStackEnterprise = false, existingRows = 0, js_theme_path =
{'templateUrl':
'https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/
themes/browserstack' }, loadWebTrackerEvents = [], EDS = {webEvents:
"web_events", webEventsPii: "web_events_pii"}, bsLib = {},
pageLoadEventProps = {}, homepageLiveForTeamsExp = 0,
vwoExperimentProps = {"homepage_footer":"control"}, headerMenuExpProps =
{"header_menu":"control"};
if (typeof userDetails === 'undefined') {
var userDetails = { location: {city: '', country: '', ip: '', region: '', longitude: '',
latitude: ''} };
}
</script><script>

```
  window.addEventListener("error", function(e, url) {
    var eleArray = ["SCRIPT"];
    if (eleArray.indexOf(e.target.tagName) != -1) {
      if ((/bstack_/.test(e.target.src))) {
          var headerJs=function(){function e(){document.getElementById("header-
habitat").innerHTML.length>0&&t()}var t=function(){function e(e)
{if(e.preventDefault(),e.stopPropagation(),this.classList.toggle("active"),this.class
List.contains("active"))c.classList.contains("active")||
c.classList.toggle("active"),l.classList.contains("hide")&&l.classList.toggle("hide");
else{c.classList.remove("active"),c.classList.contains("hide")||(c.className+="
hide");for(var t=0;t<o.length;t++)o[t].classList.contains("hide")||
(o[t].className+=" hide")}}function t(){"primary"===this.getAttribute("data-
target")&&c.classList.toggle("active"),this.closest("ul").classList.toggle("hide")}fu
nction s()
{c.classList.toggle("active"),document.getElementById(this.getAttribute("data-
trigger")).classList.toggle("hide")}for(var
a=document.getElementsByClassName("dropdown-holder-
desktop"),i=0;i<a.length;i++)a[i].addEventListener("mouseover",function(e){var
t=this.firstElementChild.getAttribute("data-
target"),s=document.getElementById(t);s.classList.contains("active")||
(s.className+=" active"),this.classList.contains("active")||(this.className+="
active")}),a[i].addEventListener("mouseleave",function(e){var
t=this.firstElementChild.getAttribute("data-
target"),s=document.getElementById(t);s.classList.remove("active"),this.classLis
t.remove("active")});var n=document.getElementById("primary-menu-
toggle"),c=document.getElementById("primary-
menu"),l=document.getElementById("primary-menu-
container"),o=document.getElementsByClassName("mobile-dropdown-
menu");n.addEventListener("click",e);for(var
d=document.getElementsByClassName("back"),r=document.getElementsByClas
sName("forward"),m=document.getElementsByClassName("dropdown-toggle-
mobile"),i=0;i<d.length;i++)d[i].addEventListener("click",t);for(var
i=0;i<r.length;i++)r[i].addEventListener("click",t);for(var i=0;i<m.length;i+
+)m[i].addEventListener("click",s)};e()}();
      }
    }
  }, true);
</script> <script async=""
src="https://js.sentry-cdn.com/c9636320258848db994911a8f578111c.min.js"
integrity="sha384-fLV/HwA8MKeOc5vzcTTzFqixFKWdER4VYqKl+306sYmalqgn1u
QjI4ROXZ9mmdw/" crossorigin="anonymous"></script> <script>
window.addEventListener('load', function(event) {  // Window load starts
 var DisableSentryEvent = false;
 if (/(^|\.)wpengine\.com$/.test(location.hostname)) {
    DisableSentryEvent = (window.location.host.split('.')[0] != "bsengineering" ?
true: false);
 }
 Sentry.onLoad(function() {
      Sentry.init({
        environment: 'production',
        debug: false,
        ignoreUrls: [
          "https://www.google.com/recaptcha/api.js", // Recaptcha Library Js
          "https://www.gstatic.com/", // Analytics Library Js
```

```
        "https://www.google-analytics.com/analytics.js", // Analytics Library Js
        "/dev\.visualwebsiteoptimizer\.com/", // VWO Js
        "https://static.ads-twitter.com/uwt.js", //  Twitter ads js
        "https://bat.bing.com/bat.js", // Bat pixel added via GTM
        "https://connect.facebook.net/en_US/fbevents.js", // Facebook auth js
        "https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-
content/themes/browserstack/src/js/libraries/amplitude-4.1.1-min.gz.js", //
Amplitude Library Js
        "/connect\.facebook\.net/", // Facebook PIxel Js
        "/youtube\.com/", // Youtube Player default js
        "https://static.doubleclick.net/instream/ad_status.js", // Double Click ad js
        "/chrome-extension/", // Any Chrome extension js
        "/m=gis_client_library", // This is mostly from third party Google One Tap
JS
        "/gsi/", // Google One Tap JS file regex
        "/_/gsi/_/js/", // Google One Tap JS file regex
        "https://accounts.google.com/gsi/client", // Google One Tap JS
        "https://server.recotap.com/" //Recotap third party JS
      ],
      ignoreErrors: [
        "Cannot read property 'hide' of null",
        "Cannot read property 'length' of undefined",
        "Persistent storage maximum size reached",
        "i is null",
        "t is not a function",
        "Cannot set property 'tabindex' of undefined",
        "Can't create RTCPeerConnections when the network is down",
        "Failed to execute 'send' on 'RTCDataChannel': Could not send data",
        "Failed to construct 'RTCPeerConnection': Failed to initialize native
PeerConnection.",
        "Failed to construct 'RTCPeerConnection': No PeerConnection handler can
be created, perhaps WebRTC is disabled?",
        "Failed to execute 'close' on 'RTCPeerConnection': The
RTCPeerConnection's signalingState is 'closed'.",
        "Failed to execute 'addIceCandidate' on 'RTCPeerConnection': The ICE
candidate could not be added.",
        "RTCPeerConnection is gone (did you enter Offline mode?)",
        "CSSStyleSheet.cssRules getter: Not allowed to access cross-origin
stylesheet", // This error is coming only on firefox browser, and that too on the
vwo  script.
        "C", // Error coming from Linux OS and for chrome 79
        "Cannot read property 'getReadModeRender' of undefined", // coming on
“Chrome Mobile WebView“ and occurring for just one combination.
        "a[b].target.className.indexOf is not a function. (In
'a[b].target.className.indexOf(Zb)', 'a[b].target.className.indexOf' is
undefined)", // It is coming from Google chrome extension Google translate.
        "Maximum call stack size exceeded", // Mostly due to recursive function
with a base case that isn't being met. Not from our code.
        "A", // This is mostly from third party Google One Tap JS
        "z", // This is mostly from third party Google One Tap JS
        "B", // This is mostly from third party Google One Tap JS
        "E", // This is mostly from third party Google One Tap JS
        "A network error occurred", // Network Error. Currently no action item for
Network errors
```

```
        "$ is not defined", // ReferenceError. This error is not expected from our
code base coz we dont have jquery.
        "ResizeObserver loop completed with undelivered notifications", // This
mostly comes from an JS animations in our case we don't have such any
animations hence seems like coming from third party extension.
        "undefined is not an object (evaluating
'document.getElementsByTagName('video')[0].webkitExitFullScreen')", // This
error coming from firefox ios devices when user exit from video. Which we don't
have any control over it.
        "t.offset() is null", // This error coming from VWO third party library.
        "SecurityError: The operation is insecure", // This error coming only from
mozila desktop browser and there is no action item.
        "Non-Error exception captured",  // These types of error are caused when a
rejection is raised with a non-error object, from which we cannot extract much
information.
        "Non-Error promise rejection captured",  // These types of error are caused
when a rejection is raised with a non-error object, from which we cannot extract
much information.
        "Failed to fetch", // Recotap API fetch error in chrome
        "NetworkError when attempting to fetch resource.", // Recotap API fetch
error in firefox
        "Load failed", // Recotap API fetch error in safari mobile
        "cancelled" // Recotap API fetch error in IOS chrome & safari
      ],
      beforeSend: function(event, hint) {
        var error = hint.originalException;
        //Check Autoptimise load event found and disable Sentry event
        if (error && error.name && error.name.match(/Internal File
FileLoadException/i)) {
          DisableSentryEvent = true; //disable fileload exception
        } else if (error && error.name && (error.name.match(/Third Party
FileLoadException/i) || error.name.match(/NetworkError/i))) { // Network Error.
Currently no action item for Network errors
          return null;
        }
        //check disable sentry event
        if (DisableSentryEvent) { return null; }
        return event;
      },
    });
  });
      Sentry.configureScope(function(scope) { scope.setTag("wp-post-type",
"guide"); });
      window.addEventListener("error", function(e, url) {
      if (typeof(Sentry) === 'undefined') { return;}
      var ele, eleArray = ["SCRIPT"], resourceMap = { "SCRIPT": "JavaScript
File" };

            try { ele = e.target; } catch (e) { return; }
      if (eleArray.indexOf(ele.tagName) != -1) {
        var url = ele.src, setExtra, error = new Error(resourceMap[ele.tagName] +
": " + url + " failed loading.");
        if ((/visualwebsiteoptimizer/.test(url)) || (/analytics/.test(url)) ||
(/amplitude/.test(url)) || (/bat.bing.com/.test(url)) ||
```

```
(/wchat.freshchat.com/.test(url)) || (/freshworksapi.com/.test(url)) ||
(/googletagmanager/.test(url)) || (/google.com/.test(url)) ||
(/server.recotap.com/.test(url))) {
          error.name = 'Third Party FileLoadException';
          setExtra = 'ThirdParty';
        } else {
          error.name = 'Internal File FileLoadException';
          setExtra = 'InternalFile';
        }
        try {            Sentry.withScope(function(scope) {
            scope.setExtra('FileName', setExtra);
            Sentry.captureException(error);
          });
        } catch (e) {
          Sentry.withScope(function(scope) {
            scope.setExtra('Error Origin', 'Catch Function of File Load');
            Sentry.captureException(e);
          });
        }
      } else if (['LINK'].indexOf(ele.tagName) != -1) {           var intVar = 0,
handleCSSTimer = setInterval(function() {             var handleLoadCSS =
document.getElementById('bstack-load-error-css');
          if (ele.getAttribute("rel") === "stylesheet" && handleLoadCSS && null !=
handleLoadCSS.getAttribute("media")) { handleLoadCSS.setAttribute("media",
"all"); clearInterval(handleCSSTimer); }
          if (intVar > 5) { clearInterval(handleCSSTimer); }
          intVar += 1;
        }, 1000);
      }
    }, true);

  }); // Window load ends

 </script>   <script>
    (function(w,d,s,l,i){w[l]=w[l]||[];w[l].push({'gtm.start':
    new Date().getTime(),event:'gtm.js'});var f=d.getElementsByTagName(s)[0],
    j=d.createElement(s),dl=l!='dataLayer'?'&l='+l:'';j.defer=true;j.src=
    'https://www.googletagmanager.com/gtm.js?id='+i+dl+
'&gtm_auth=6u6X4YDLegPVQK8iBE4Bpg&gtm_preview=env-
37&gtm_cookies_win=x';f.parentNode.insertBefore(j,f);
    })(window,document,'script','dataLayer','GTM-KX7NTRZ');
  </script>  <script>
  var bsGaDomain = 'browserstack';
  var EdsConfig = {
    "server": "eds.browserstack.com",
    "port": "443",
    "api": "3T5kkUTZ2cGiy0zhLwyxBdDbx0GeJuZQd"
  };
 </script>  <script type="text/javascript">
  var clientId;
  function gaOnloadTrackerAddDimension(){
      var custom_tracker = window.ga
                          && window.ga.getByName
                          && window.ga.getByName(bsGaDomain);
```

```
        if (custom_tracker) {
            clientId = custom_tracker.get('clientId');
            window.ga(bsGaDomain + '.set', 'dimension4', clientId);

            window.dataLayer = window.dataLayer || [];
            window.dataLayer.push({dimension4: clientId});
        }
        ga(bsGaDomain + '.set', 'dimension7', String(Math.round(new
Date()/1000)));
        ga(bsGaDomain + '.set', 'anonymizeIp', true);
        ga(bsGaDomain + '.send', 'pageview');
    }

        (function(i,s,o,g,r,a,m){i['GoogleAnalyticsObject']=r;i[r]=i[r]||function(){
    (i[r].q=i[r].q||[]).push(arguments)},i[r].l=1*new Date();a=s.createElement(o),
     m=s.getElementsByTagName(o)[0];a.defer=true;a.src=g;
     a.onload = a.onreadystatechange = gaOnloadTrackerAddDimension;
     m.parentNode.insertBefore(a,m);
    })(window,document,'script','//www.google-analytics.com/analytics.js','ga');
        ga('create', "UA-418548-18", bsGaDomain + '.com');
    ga('create', "UA-418548-19", bsGaDomain + '.com', {'name': bsGaDomain});
    </script>  <script>
    // Add all acf variables here.
    // Freshchat Events
    var FreshChatConfig = {
      api : "624243d8-8006-4cae-a3f5-54cdaa3c156a",
      show : true,
      host: "https://wchat.freshchat.com",
      tags: ["free_user"],
      cookieName: "show_freshchat",
      inactivityTimer: 30000,
      scrollY: 1200,
      vwoShow: 0,
      startWorkingHours: "09:30:00",
      endWorkingHours: "21:30:00",
      customWidgetValue : false,
      chatBubble: {
        visible: true,
        text: "Hi there! Need any assistance?",
        timer: 0      },
      customWidgetChat: {
        visible: true,
        text: "Talk to an Expert"
      },
      enableFreshChatOnPage: 0,
    }


          var floatingBannerEvents = {
        interact: "InteractedWithFloatingBanner",
        click: "Get Started Free",
        close: "close"
      }
```

var popUpCSFOptions = {
utm_source: "",
cta_ref: "",
source: "",
vwoShow: 0 }, popUpSignUpOptions = {
source: "",
vwoShow: 0
};

pageLoadEventProps = {"action": "GuidePage_TopFold_Exp1"};
popUpCSFOptions.vwoShow = 1;
popUpCSFOptions.source = 'GuidePage_TopFold_Exp1';
</script> <meta name="robots" content="index, follow, max-image-preview:large, max-snippet:-1, max-video-preview:-1"> <script type="text/javascript">
if (window.innerWidth > 979) {
var _vwo_code=(function(){
var account_id=366135,
settings_tolerance=5000,
library_tolerance=5000,
use_existing_jquery=false,
f=false,d=document;return{use_existing_jquery:function(){return use_existing_jquery;},library_tolerance:function(){return library_tolerance;},finish:function(){if(!f){f=true;var a=d.getElementById('_vis_opt_path_hides');if(a)a.parentNode.removeChild(a);}},finished:function(){return f;},load:function(a){var b=d.createElement('script');b.src=a;b.type='text/javascript';b.innerText;b.onerror=function(){_vwo_code.finish();};d.getElementsByTagName('head')[0].appendChild(b);},init:function(){settings_timer=setTimeout('_vwo_code.finish()',settings_tolerance);this.load('//dev.visualwebsiteoptimizer.com/j.php?a='+account_id+'&u='+encodeURIComponent(d.URL)+'&r='+Math.random());var a=d.createElement('style'),b='body{opacity:0 !important;filter:alpha(opacity=0) !important;background:none !important;}',h=d.getElementsByTagName('head')[0];a.setAttribute('id','_vis_opt_path_hides');a.setAttribute('type','text/css');if(a.styleSheet)a.styleSheet.cssText=b;else a.appendChild(d.createTextNode(b));h.appendChild(a);return settings_timer;}};}());_vwo_settings_timer=_vwo_code.init();}
</script> <meta name="description" content="Learn different ways to inspect element on iPhone. Developers & QA choose BrowserStack's Real Device Cloud to test on iPhones. Read more."> <link rel="canonical" href="https://www.browserstack.com/guide/how-to-inspect-element-on-iphone"> <meta property="og:locale" content="en_US"> <meta property="og:type" content="article"> <meta property="og:title" content="How to inspect element on iPhone | BrowserStack"> <meta property="og:description" content="Learn different ways to inspect element on iPhone. Developers & QA choose BrowserStack's Real Device Cloud to test on iPhones. Read more."> <meta property="og:url" content="https://browserstack.wpengine.com/guide/how-to-inspect-element-on-iphone/"> <meta property="og:site_name" content="BrowserStack"> <meta property="article:publisher" content="https://www.facebook.com/BrowserStack/"> <meta property="article:modified_time" content="2022-06-09T16:34:35+00:00"> <meta property="og:image" content="https://3fxtqy18kygf3on3bu39kh93-

wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Top-5-JavaScript-Testing-Frameworks-18.png"> <meta property="og:image:width" content="1160">
<meta property="og:image:height" content="1048"> <meta
property="og:image:type" content="image/png"> <meta name="twitter:card"
content="summary_large_image"> <meta name="twitter:site"
content="@browserstack"> <script type="application/ld+json">
    {
      "@context": "https://schema.org",
      "@type": "BreadcrumbList",
      "itemListElement": [{
        "@type": "ListItem",
        "position": 1,
        "item": {
          "@id": "https://www.browserstack.com",
          "name": "Home"
        }
      }, {
        "@type": "ListItem",
        "position": 2,
        "item": {
          "@id": "https://www.browserstack.com/guide",
          "name": "Guide"
        }
      }, {
        "@type": "ListItem",
        "position": 3,
        "item": {
          "@id": "https://www.browserstack.com/guide/how-to-inspect-element-on-iphone",
          "name": "How to inspect element on iPhone"
        }
      }]
    }
  </script> <script type="text/javascript">
    var codeSnippetVal = {
      content: 'Try Testing Code on Real Device Cloud for Free',
      ctaText: 'Get Started Free',
      ctaUrl: '/users/sign_up?ref=guide-how-to-inspect-element-on-iphone-code-tooltip'
    }
  </script> <script
src="https://server.recotap.com/8IAc4mlSslRuoieGfxtQjVnWakIUfY/recotap-client.js?app_id=8IAc4mlSslRuoieGfxtQjVnWakIUfY" defer=""></script> <script
type="application/ld+json">
  {
    "@context": "https://schema.org",
    "@type": "Article",
    "mainEntityOfPage": {
      "@type": "WebPage",
      "@id": "https://www.browserstack.com/guide/how-to-inspect-element-on-iphone"
    },
    "headline": "How to inspect element on iPhone | BrowserStack",

"description": "Learn different ways to inspect element on iPhone. Developers & QA choose BrowserStack's Real Device Cloud to test on iPhones. Read more.",
"image": "https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Top-5-JavaScript-Testing-Frameworks-18.png",
"author": {
"@type": "Person",
"name": "Jash Unadkat"
},
"publisher": {
"@type": "Organization",
"name": "BrowserStack",
"logo": {
"@type": "ImageObject",
"url": "https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/browserstack-logo.svg"
}
},
"datePublished": "2022-05-13"
}
</script> <style type="text/css" data-type="vc_custom-css">pre.prettyprint{ margin-bottom:0;}</style><noscript><style> .wpb_animate_when_almost_visible { opacity: 1; }</style></noscript> <script>
AmplitudeAnalytics = {
"api_key": "985eaa9c45d824a94344e64a2a3ca724"
};
var googleAuthClientID = "1066772918720-sv90pdq4skohjdbk79hja51t75ro8t6t.apps.googleusercontent.com";
</script> <style id="bstack-load-error-css" type="text/css" media="none">.cookie-notification:not(.hide) {display:block}.wrapper>main{visibility:visible}.footer-habitat,.secondary-nav,.page-wrapper-on-load{visibility:visible}.contact-pill,.bs-modal,.docs--container{display:block}.header-habitat .secondary-nav .product-name{font-size:28px}.header-habitat .secondary-nav .show-logo{font-size:21px;padding-left:20px}</style><link rel="stylesheet" type="text/css" href="https://cdn.rawgit.com/google/code-prettify/master/loader/prettify.css"><script src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/js/dist/bstack-load-scripts.js?v=1659000872"></script></head> <body class="guide-template-default single single-guide postid-24497 how-to-inspect-element-on-iphone persistent-header header-with-promo-bar bstack-wp docs-search-auth-user wpb-js-composer js-comp-ver-6.9.0 vc_responsive persistent-up" style="padding-top: 63px;"> <script type="text/javascript">

try {
var intS = 0,
eTime = setInterval(function() {
var promoBar = document.getElementById("promo-notification"),
cookieNotification = document.getElementById("cookie-notification"),
isSupported = false;
if (promoBar) {
if (getCookieVal("closePromoNotification") || window.innerWidth < 979) {
promoBar.remove();

```
          } else {
            promoBar.classList.remove("hide");
          }
        }
        // adding try catch for localstorage
        try {
          isSupported = window.localStorage ? true : false;
        } catch (e) {}
        if (isSupported) {
          if (!localStorage.getItem("cookie-notification-approved") &&
cookieNotification) {
            cookieNotification.classList.remove("hide");
          }
        }
        if (++intS >= 10) {
          clearInterval(eTime);
        }
      }, 100);
    } catch (e) {}
  </script>  <noscript>&lt;iframe class="b-lazy b-lazy-hidden"
src="
cmcvMjAwMC9zdmcnIHZpZXdCb3g9JzAgMCAzIDInPjwvc3ZnPg==" data-
lazysrc="https://www.googletagmanager.com/ns.html?id=GTM-
KX7NTRZ&amp;gtm_auth=6u6X4YDLegPVQK8iBE4Bpg&amp;gtm_preview=env-
37&amp;gtm_cookies_win=x" height="0" width="0"
style="display:none;visibility:hidden"&gt;&lt;/iframe&gt;</noscript>   <div
class="wrapper" id="page__wrapper"> <a href="#main-content" class="skip-
link">Skip to main content</a>  <header id="header-habitat" class="header-
habitat marketing-header " style="top: 0px;"> <div class="container top-bar-
menu-container"> <div class="row"> <div class="col-xs-12">  <a class="logo"
id="logo" href="/" title="BrowserStack"> <svg height="32" viewBox="0 0 180
32" width="188" class="w-svg" xmlns="http://www.w3.org/2000/svg"><g
fill="none" fill-rule="evenodd"><g><path d="m31.0344828 15.5172414c0
8.5701882-6.9470532 15.5172414-15.5172414 15.5172414-8.56989423 0-
15.5172414-6.9470532-15.5172414-15.5172414 0-8.56989423 6.94734717-
15.5172414 15.5172414-15.5172414 8.5701882 0 15.5172414 6.94734717
15.5172414 15.5172414" fill="#ecb360"></path><path d="m26.8965517
13.9655172c0 7.7128847-6.0213369 13.9655173-13.4482758 13.9655173-
7.42722227 0-13.4482759-6.2526326-13.4482759-13.9655173 0-7.71288459
6.02105363-13.9655172 13.4482759-13.9655172 7.4269389 0 13.4482758
6.25263261 13.4482758 13.9655172" fill="#d76835"></path><path
d="m27.9310345 12.4136422c0 6.8560652-5.3263006 12.413944-11.8969855
12.413944-6.5698174 0-11.89611797-5.5578788-11.89611797-12.413944 0-
6.85576335 5.32630057-12.4136422 11.89611797-12.4136422 6.5706849 0
11.8969855 5.55787885 11.8969855 12.4136422"
fill="#d33a41"></path><path d="m26.8965517 13.4484262c0 6.2843054-
4.8632703 11.37916-10.8622124 11.37916-5.9989422 0-10.86192551-
5.0948546-10.86192551-11.37916 0-6.28490677 4.86298331-11.37946068
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mask="url(#79xt25gxub)"> <path d="M0 0H62.5V62.5H0z"
transform="translate(-16.25 -16.25)"></path> </g> </g></svg> </button>

<button class="collapse-toggle pull-right bs-collapse-toggle" data-target="primary-menu" id="primary-menu-toggle" aria-label="Menu Toggle"> <svg width="24" height="18" alt="Icon for hamburger menu" version="1.1" id="hamburger_menu_Layer_1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" viewBox="0 0 24.6 19.4" enable-background="new 0 0 24.6 19.4" xml:space="preserve"><g id="XMLID_131_"> <path id="XMLID_259_" fill="#FFFFFF" d="M23.3,3h-22c-0.5,0-1-0.4-1-1v0c0-0.5,0.4-1,1-1h22c0.5,0,1,0.4,1,1v0 C24.3,2.6,23.8,3,23.3,3z"></path> <path id="XMLID_281_" fill="#FFFFFF" d="M23.3,10.7h-22c-0.5,0-1-0.4-1-1v0c0-0.5,0.4-1,1-1h22c0.5,0,1,0.4,1,1v0 C24.3,10.2,23.8,10.7,23.3,10.7z"></path> <path id="XMLID_282_" fill="#FFFFFF" d="M23.3,18.3h-22c-0.5,0-1-0.4-1-1v0c0-0.5,0.4-1,1-1h22c0.5,0,1,0.5,1,1v0 C24.3,17.9,23.8,18.3,23.3,18.3z"></path></g></svg> <svg width="18" height="18" alt="Icon for closing window" version="1.1" id="closingWindowLayer_1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" viewBox="0 0 18.8 19.4" enable-background="new 0 0 18.8 19.4" xml:space="preserve"><path id="XMLID_130_" fill="#FFFFFF" d="M17.9,16.9c0.4,0.4,0.4,1,0,1.4c-0.2,0.2-0.5,0.3-0.7,0.3c-0.3,0-0.5-0.1-0.7-0.3l-7.1-7.1 l-7.1,7.1c-0.2,0.2-0.5,0.3-0.7,0.3c-0.3,0-0.5-0.1-0.7-0.3c-0.4-0.4-0.4-1,0-1.4L8,9.8L0.9,2.7c-0.4-0.4-0.4-1,0-1.4 C1.1,1.1,1.4,1,1.6,1c0.2,0,0.5,0.1,0.7,0.3l7.1,7.1l7.1-7.1C16.7,1.1,16.9,1,17.2,1c0.3,0,0.5,0.1,0.7,0.3c0.4,0.4,0.4,1,0,1.4 l-7.1,7.1L17.9,16.9z"></path></svg> </button> <nav class="product-nav hide-sm hide-xs " id="product-nav" aria-label="Primary Menu"> <ul class="horizontal-list product-menu"> <li class="dropdown-holder dropdown-holder-desktop product-list-item"> <button class="product-dropdown-toggle dropdown-toggle hide-sm hide-xs" data-target="product-menu-dropdown" id="product-menu-toggle" aria-label="Products" aria-expanded="false" aria-haspopup="true">Products<svg xmlns="http://www.w3.org/2000/svg" width="16" height="16" viewBox="0 0 24 24"><path d="M7.41 8.59L12 13.17l4.59-4.58L18 10l-6 6-6-6 1.41-1.41z"></path><path fill="none" d="M0 0h24v24H0V0z"></path></svg></button>   <ul class="dropdown-section col-xs-5 no-pad"> <li class="section-head"> <svg xmlns="http://www.w3.org/2000/svg" alt="Test your websites" width="15" height="15" fill="none" xmlns:v="https://vecta.io/nano"><g clip-path="url(#AA)" fill="#000"><path fill-rule="evenodd" d="M1.071 1h12.857A1.07 1.07 0 0 1 15 2.071v10.714a1.07 1.07 0 0 1-1.071 1.071H1.071A1.07 1.07 0 0 1 0 12.786V2.071A1.07 1.07 0 0 1 1.071 1zm12.857 2.143V2.071H1.071v1.071h12.857zM1.071 4.214v8.571h12.857V4.214H1.071zm8.036 2.143H3.214v1.071h5.893V6.357zm1.071 2.679H3.214v1.071h6.964V9.036z"></path><path d="M14.686 1.314l-.061.061h0l.061-.061zm0 12.229l-.061-.061h0l.061.061zm-14.372 0l-.061.061h0l.061-.061zm0-12.229l-.061-.061h0l.061.061zm13.615.758h.086v-.086h-.086v.086zm0 1.071v.086h.086v-.086h-.086zM1.071 2.071v-.086H.986v.086h.086zm0 1.071H.986v.086h.086v-.086zm0 9.643H.986v.086h.086v-.086zm0-8.571v-.086H.986v.086h.086zm12.857 8.571v.086h.086v-.086h-.086zm0-8.571h.086v-.086h-.086v.086zM3.214 6.357v-.086h-.086v.086h.086zm5.893 0h.086v-.086h-.086v.086zM3.214 7.429h-.086v.086h.086v-.086zm5.893

0v.086h.086v-.086h-.086zM3.214 9.036V8.95h-.086v.086h.086zm6.964
0h.086V8.95h-.086v.086zm-6.964 1.071h-.086v.086h.086v-.086zm6.964
0v.086h.086v-.086h-.086zm3.75-
9.193H1.071v.171h12.857V.914zm.818.339c-.217-.217-.511-.339-.818-.339v.17
1c.261
0 .512.104.697.289l.121-.121zm.339.818c0-.307-.122-.601-.339-.818l-.121.121c.
185.185.289.436.289.697h.171zm0
10.714V2.071h-.171v10.714h.171zm-.339.818c.217-.217.339-.511.339-.818h-.1
71c0 .261-.104.512-.289.697l.121.121zm-.818.339c.307
0 .601-.122.818-.339l-.121-.121c-.185.185-.436.289-.697.289v.172zm-12.857
0h12.857v-.171H1.071v.172zm-.818-.339c.217.217.511.339.818.339v-.171c-.26
1
0-.512-.104-.697-.289l-.121.121zm-.339-.818c0 .307.122.601.339.818l.121-.121
c-.185-.185-.289-.436-.289-.697h-.171zm0-
10.714v10.714h.171V2.071h-.171zm.339-.818c-.217.217-.339.511-.339.818h.17
1c0-.261.104-.512.289-.697l-.121-.121zm.818-.339c-.307
0-.601.122-.818.339l.121.121c.185-.185.436-.289.697-.289V.914zm12.771
1.157v1.071h.171V2.071h-.171zm-
12.771.086h12.857v-.171H1.071v.171zm.086.986V2.071H.986v1.071h.171zm1
2.771-.086H1.071v.171h12.857v-.171zM1.157
12.786V4.214H.986v8.571h.171zm12.771-.086H1.071v.171h12.857V12.7zm-.08
6-8.486v8.571h.171V4.214h-.171zM1.071 4.3h12.857v-.171H1.071V4.3zm2.143
2.143h5.893v-.171H3.214v.171zm.086.986V6.357h-.171v1.071H3.3zm5.807-.08
6H3.214v.171h5.893v-.171zm-.086-.986v1.071h.171V6.357h-.171zM3.214
9.121h6.964V8.95H3.214v.171zm.086.986V9.036h-.171v1.071H3.3zm6.879-.08
6H3.214v.172h6.964v-.171zm-.086-.986v1.071h.171V9.036h-.171z"></
path></g><defs><clipPath id="AA"><path fill="#fff" d="M0
0h15v15H0z"></path></clipPath></defs></svg> <span
class="product-type">Test your websites   <a class="menu-
item-live" href="/live" data-product="Live" aria-label="Live"> <div
class="menu-icon-holder"> <svg alt="Icon for BrowserStack Live" width="36px"
height="34px" viewBox="0 0 45 42" version="1.1"
xmlns="http://www.w3.org/2000/svg"
xmlns:xlink="http://www.w3.org/1999/xlink"> <g id="LiveSVGFinal"
stroke="none" stroke-width="1" fill="none" fill-rule="evenodd"> <g
id="LiveSVGCard-Hover-state-Homepage" transform="translate(-320.000000, -
1160.000000)"> <g id="LiveSVGProducts" transform="translate(294.000000,
1029.000000)"> <g id="LiveSVGproducts" transform="translate(26.000000,
73.000000)"> <g id="LiveSVGwebsite"> <g id="LiveSVGLive"
transform="translate(0.000000, 57.000000)"> <g id="LiveSVGLive-icon-Copy"
transform="translate(0.000000, 1.000000)"> <g id="LiveSVGLive-Copy"> <g
id="LiveSVGLive-Copy-2"> <g id="LiveSVGbrowser"> <path d="M0,3.88888889
L37.6607143,3.88888889 L37.6607143,31.7360087 C37.6607143,32.8405782
36.7652838,33.7360087 35.6607143,33.7360087 L2,33.7360087
C0.8954305,33.7360087 1.3527075e-16,32.8405782 0,31.7360087
L0,3.88888889 Z" id="LiveSVGRectangle-11-Copy" fill="#6BC6FD"></path>
<polygon id="LiveSVGRectangle-11-Copy-4" fill="#A1DBFE"
points="5.24137931 10.3703704 31.4482759 10.3703704 31.4482759
28.5185185 5.24137931 28.5185185"></polygon> <path d="M3,-1.33226763e-
15 L34.6607143,-8.8817842e-16 C36.3175685,-1.19253761e-15
37.6607143,1.34314575 37.6607143,3 L37.6607143,6.01851852 L0,6.01851852
L-4.4408921e-16,3 C-6.46995335e-16,1.34314575 1.34314575,-5.83819232e-16
3,-8.8817842e-16 Z" id="LiveSVGRectangle-15-Copy" fill="#2A4A68"></path>
<ellipse id="LiveSVGOval-2" fill="#D0021B" cx="3.46407513"

cy="3.47358722" rx="1.15469171" ry="1.15786241"></ellipse> <ellipse id="LiveSVGOval-2-Copy" fill="#F5A623" cx="6.92815027" cy="3.47358722" rx="1.15469171" ry="1.15786241"></ellipse> <ellipse id="LiveSVGOval-2-Copy-2" fill="#7ED321" cx="10.3922254" cy="3.47358722" rx="1.15469171" ry="1.15786241"></ellipse> </g> </g> </g> <g id="LiveSVGdownload" transform="translate(21.000000, 18.000000)"> <path d="M12,24 C5.383125,24 0,18.616875 0,12 C0,5.383125 5.383125,0 12,0 C18.616875,0 24,5.383125 24,12 C24,18.616875 18.616875,24 12,24 Z" id="LiveSVGPath" fill="#E4E2E5"></path> <path d="M12,24 C5.383125,24 0,18.616875 0,12 C0,5.383125 5.383125,0 12,0 C18.616875,0 24,5.383125 24,12 C24,18.616875 18.616875,24 12,24 Z M12,2.46428571 C6.74207526,2.46428571 2.46428571,6.74207526 2.46428571,12 C2.46428571,17.2579247 6.74207526,21.5357143 12,21.5357143 C17.2579247,21.5357143 21.5357143,17.2579247 21.5357143,12 C21.5357143,6.74207526 17.2579247,2.46428571 12,2.46428571 Z" id="LiveSVGShape_1" fill="#142433" fill-rule="nonzero"></path> <path d="M12,15.5294118 C9.97970509,15.5294118 8.47058824,12.9668894 8.47058824,10.6754259 C8.47058824,8.51237647 9.88901221,7.05882353 12,7.05882353 C14.1109878,7.05882353 15.5294118,8.51237647 15.5294118,10.6754259 C15.5294118,12.9668894 14.0202949,15.5294118 12,15.5294118 Z" id="LiveSVGShape_2" fill="#142433" fill-rule="nonzero"></path> <path d="M18.6571464,20.4705882 C18.630321,20.4468048 16.0789656,24 11.2941176,24 C6.54417953,24 4.08763177,20.3453668 3.99245662,20.4413603 L2.82352941,19.7464814 C2.93487331,19.6321488 5.61851853,16.9411765 11.1258156,16.9411765 C16.6033476,16.9411765 19.6382956,19.6037805 19.7647059,19.716967 L18.6571464,20.4705882 Z" id="LiveSVGShape_3" fill="#142433" fill-rule="nonzero"></path> </g> </g> </g> </g> </g> </g> </g> </g></svg>   Live   Interactive cross browser testing   <a class="menu-item-automate" href="/automate" data-product="Automate" aria-label="Automate"> <svg width="36" height="34" alt="Icon for BrowserStack Automate" viewBox="0 0 45 42" version="1.1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink"> <defs> <linearGradient x1="50%" y1="100%" x2="50%" y2="0%" id="AutomateSVGlinearGradient-1"> <stop stop-color="#04BEFE" offset="0%"></stop> <stop stop-color="#4481EB" offset="100%"></stop> </linearGradient> </defs> <g id="AutomateSVGFinal" stroke="none" stroke-width="1" fill="none" fill-rule="evenodd"> <g id="AutomateSVGCard-Hover-state-Homepage" transform="translate(-320.000000, -1306.000000)"> <g id="AutomateSVGProducts" transform="translate(294.000000, 1029.000000)"> <g id="AutomateSVGproducts" transform="translate(26.000000, 73.000000)"> <g id="AutomateSVGwebsite"> <g id="AutomateSVGautomate" transform="translate(0.000000, 204.000000)"> <g id="AutomateSVGautomate-icon-copy"> <g id="AutomateSVGGroup-5-Copy"> <g id="AutomateSVGLive"> <g id="AutomateSVGLive-Copy-2"> <g id="AutomateSVGbrowser"> <path d="M0,3.9375 L38.0396534,3.9375 L38.0396534,16.1704929 L38.0396534,32.1577088 C38.0396534,33.2622783 37.1442229,34.1577088 36.0396534,34.1577088 L19.8529412,34.1577088 L2,34.1577088 C0.8954305,34.1577088 1.3527075e-16,33.2622783 0,32.1577088 L0,3.9375 Z" id="AutomateSVGRectangle-11-Copy-2" fill="#6BC6FD"></path> <path d="M0,2.625 L11.0786502,2.625 L11.0786502,34.1577088 L2,34.1577088 C0.8954305,34.1577088 2.09738034e-15,33.2622783 0,32.1577088 L0,2.625 Z"

id="AutomateSVGRectangle-11" fill="#BBE6FF"
opacity="0.684669384"></path> <path d="M3,-1.33226763e-15 L35.0396534,-
1.77635684e-15 C36.6965076,-2.08071603e-15 38.0396534,1.34314575
38.0396534,3 L38.0396534,6.09375 L0,6.09375 L0,3 C-2.02906125e-
16,1.34314575 1.34314575,-1.47199765e-15 3,-1.77635684e-15 Z"
id="AutomateSVGRectangle-15" fill="#2A4A68"></path> <ellipse
id="AutomateSVGOval-2" fill="#D0021B" cx="3.49893038" cy="3.51700706"
rx="1.16631013" ry="1.17233569"></ellipse> <ellipse id="AutomateSVGOval-
2-Copy" fill="#F5A623" cx="6.99786076" cy="3.51700706" rx="1.16631013"
ry="1.17233569"></ellipse> <ellipse id="AutomateSVGOval-2-Copy-2"
fill="#7ED321" cx="10.4967911" cy="3.51700706" rx="1.16631013"
ry="1.17233569"></ellipse> </g> </g> </g> <g id="AutomateSVGGroup-2"
transform="translate(21.176471, 18.375000)"> <path
d="M7.06780858,15.8583699 C4.68939204,13.4290881
4.68939204,9.46126114 7.14982294,7.03197933 C9.61025385,4.60269752
13.6289577,4.68367358 16.0893886,7.11295539 C18.4678051,9.5422372
18.4678051,13.5100642 16.0073742,15.939346 C13.5469433,18.2876517
9.52823948,18.2876517 7.06780858,15.8583699 Z" id="AutomateSVGPath-
Copy-2" fill="#E4E2E5"></path> <path d="M8.0068386,15.5272192
C5.93382441,13.4098711 5.93382441,9.95153592 8.07832185,7.83418785
C10.2228193,5.71683979 13.7254984,5.78741805 15.8699959,7.90476612
C17.9430101,10.0221142 17.9430101,13.4804494 15.7985126,15.5977974
C13.6540152,17.6445672 10.151336,17.6445672 8.0068386,15.5272192 Z
M21.2312395,9.95153592 C20.9445917,8.75170535 20.516407,7.62245305
19.8015745,6.56377901 L21.1597562,5.29337017 C21.4449744,5.0110571
21.4449744,4.51700921 21.1597562,4.23469614 L19.6578932,2.75255249
C19.372675,2.47023941 18.8722923,2.47023941 18.5856445,2.75255249
L17.2996608,3.95238306 C16.2274121,3.24660037 15.0836802,2.75255249
13.8684649,2.54081768 L13.8684649,0.776360959 C13.8684649,0.352891345
13.5110487,0 13.0814344,0 L10.9376518,0 C10.5087523,0
10.151336,0.352891345 10.151336,0.776360959 L10.151336,2.54081768
C8.93540599,2.82313076 7.79238886,3.24660037 6.72014014,3.95238306
L5.3612436,2.68197422 C5.07602544,2.39966114 4.5756427,2.39966114
4.28899488,2.68197422 L2.7885615,4.16411787 C2.50191368,4.44643094
2.50191368,4.94047883 2.7885615,5.2227919 L4.00377672,6.49320074
C3.28894424,7.55187478 2.7885615,8.68112708 2.57411176,9.88095765
L0.78703056,9.88095765 C0.35741624,9.88095765 0,10.233849 0,10.6573186
L0,12.7746667 C0,13.1981363 0.35741624,13.5510276
0.78703056,13.5510276 L2.57411176,13.5510276 C2.85932992,14.7508582
3.28894424,15.8801105 4.00377672,16.9387845 L2.71707825,18.1386151
C2.43114526,18.4209282 2.43114526,18.9149761 2.71707825,19.1972892
L4.21822646,20.6794328 C4.50415945,20.9617459 5.00382736,20.9617459
5.29047518,20.6794328 L6.57717364,19.4796022 C7.64942236,20.1853849
8.79315433,20.6794328 10.0076547,20.8911676 L10.0076547,22.6556243
C10.0076547,23.0790939 10.365071,23.4319853 10.7946853,23.4319853
L12.9391827,23.4319853 C13.3680822,23.4319853 13.7254984,23.0790939
13.7254984,22.6556243 L13.7254984,20.8911676 C14.9407137,20.6088545
16.0837308,20.1853849 17.1559795,19.4796022 L18.442678,20.8205893
C18.7293258,21.1029024 19.2297085,21.1029024 19.5149267,20.8205893
L21.0167897,19.3384457 C21.3020079,19.0561326 21.3020079,18.5620847
21.0167897,18.2797717 L19.8015745,17.0093628 C20.516407,15.9506888
21.0167897,14.8214365 21.2312395,13.6216059 L23.0183207,13.6216059
C23.4465053,13.6216059 23.8039216,13.2687146 23.8039216,12.845245
L23.8039216,10.7278969 C23.8039216,10.3044273 23.4465053,9.95153592

23.0183207,9.95153592 L21.2312395,9.95153592 Z" id="AutomateSVGFill-1-Copy-2" fill="#142433"></path> </g> </g> </g> </g> </g> </g> </g> </g> </g></svg>   Automate   Selenium testing at scale   <a class="menu-item-percy" href="/percy" data-product="Percy" aria-label="Percy"> <svg xmlns="http://www.w3.org/2000/svg" width="36" height="34" viewBox="0 0 36 34"> <g fill="none" fill-rule="evenodd"> <path fill="#6BC6FD" d="M0 3.146h30.49v17.18c0 3.866-3.134 7-7 7H1.7c-.939 0-1.7-.76-1.7-1.7V3.146z"></path> <path fill="#2A4A68" fill-rule="nonzero" d="M2.4 0h25.632c1.325 0 2.4 1.075 2.4 2.4v2.475H0V2.4C0 1.075 1.075 0 2.4 0z"></path> <g fill="#C0E4FC"> <path d="M0 0H10.797V15.229H0zM13.07 0H23.867V15.229H13.07z" transform="translate(3.245 8.33)"></path> </g> <circle cx="2.799" cy="2.814" r="1" fill="#D0021B" fill-rule="nonzero"></circle> <circle cx="5.598" cy="2.814" r="1" fill="#F5A623" fill-rule="nonzero"></circle> <circle cx="8.397" cy="2.814" r="1" fill="#7ED321" fill-rule="nonzero"></circle> <g fill="#142433"> <path d="M25.358 4.673c-.112-.37-.446-.62-.831-.62-.115 0-.227.023-.334.068-.273.114-.699.248-1.231.273-.918-.861-3.457-2.788-5.233-3.755 0 0 .216.634.516 1.818 0 0-1.913-1.494-4.078-2.457 0 0 .61 1.25.66 1.655 0 0-1.986-.692-4.772-.954 0 0 1.338.934 1.857 1.647 0 0-1.97-.1-4.91 0 0 0 1.671.678 2.41 1.3 0 0-3.49.355-5.463.922 0 0 2.222.784 2.84 1.367 0 0-2.835.807-5.69 2.456 0 0 1.586.278 2.828.82 0 0-1.582 1.106-3.927 4.124 0 0 1.733-.33 2.922-.238 0 0-1.507 1.76-2.292 4.452 0 0 .871-.555 1.715-.756 0 0 .09 3.21 1.846 3.723l.001-.002c.086.027.168.037.24.037.085 0 .175-.013.266-.04.557-.159.978-.708 1.466-1.344.16-.209.324-.422.498-.631.195-.276.45-.563.756-.816.62-.512 1.479-.899 2.525-.744 1.177.1 1.905 1.273 2.49 2.216.303.49.706 1.359 1.38 1.359.745 0 1.007-.893 1.338-1.994.31-1.034.78-2.03 1.38-2.924 1.163-1.73 2.65-2.67 4.432-3.597 1.708-.888 3.322-1.727 4.132-3 .404-.637.605-1.418.596-2.322-.008-.811-.185-1.559-.333-2.043zm-8.784-.732l-2.152-1.379 3.548 1.265-1.396.114zm-5.916.63l3.408.871 1.486-.493-4.894-.379zm6.076 1.708l.727-.55-2.814.472 2.087.078zm-4.822 0l-1.166.781-3.23-.308 4.396-.473zm3.64 1.952l1.182-.662-4.396.473 3.214.189zm-3.257.734l-.824 1.354-4.124 1.01 4.948-2.364zm-5.153.834L3.95 11.204l3.92-2.81-.727 1.405zm-1.746 1.685L5.27 12.89l-1.833 2.3 1.959-3.706z" transform="translate(9.5 12.533)"></path> <path fill-rule="nonzero" d="M16.912 20.204c-.358-.005-.738-.312-1.155-.934.246-1.407 1.218-3.206 2.388-4.411-.299 1.12-.339 2.244-.37 3.148-.021.585-.04 1.09-.122 1.456-.112.492-.357.742-.728.742h-.013zM7.002 19.188c.303.686.628 1.02.99 1.02.03 0 .059-.002.088-.007.492-.077.948-1.03 1.33-1.954.098-.24.191-.479.274-.7-1.09.013-2.149.889-2.682 1.641z" transform="translate(9.5 12.533)"></path> </g> </g></svg>   Percy New   Visual testing & review   <ul class="dropdown-section col-xs-7"> <li class="section-head"> <svg alt="Test your mobile apps" width="10" height="15" viewBox="0 0 10 15" fill="none" xmlns="http://www.w3.org/2000/svg"><g clip-path="url(#clip0_612_21136)"><path d="M1.125 15L7.875 15C8.17328 14.9997 8.45925 14.8811 8.67017 14.6702C8.88108 14.4593 8.9997 14.1733 9 13.875L9 1.5C8.99966 1.20174 8.88102 0.91579 8.67012 0.704886C8.45921 0.493981 8.17326 0.375345 7.875 0.375003L1.125 0.375002C0.826756 0.375404 0.54084 0.494059 0.329949 0.70495C0.119058 0.915841

0.000402667 1.20176 8.22579e-07 1.5L-2.59277e-07 13.875C0.000342127
14.1733 0.118978 14.4592 0.329882 14.6701C0.540787 14.881 0.826736
14.9997 1.125 15ZM1.125 13.875L1.125 1.5L7.875 1.5L7.875 13.875L1.125
13.875Z" fill="black"></path><path d="M1.125 1.5L1.125 13.875L7.875
13.875L7.875 1.5M1.125 1.5L7.875 1.5M1.125 1.5L1.125 11.625M7.875
1.5L7.875 11.625M1.125 15L7.875 15C8.17328 14.9997 8.45925 14.8811
8.67017 14.6702C8.88108 14.4593 8.9997 14.1733 9 13.875L9 1.5C8.99966
1.20174 8.88102 0.91579 8.67012 0.704886C8.45921 0.493981 8.17326
0.375345 7.875 0.375003L1.125 0.375002C0.826756 0.375404 0.54084
0.494059 0.329949 0.70495C0.119058 0.915841 0.000402667 1.20176
8.22579e-07 1.5L-2.59277e-07 13.875C0.000342127 14.1733 0.118978 14.4592
0.329882 14.6701C0.540787 14.881 0.826736 14.9997 1.125 15Z"
stroke="black" stroke-width="0.1536"></path><circle cx="4.60687"
cy="12.4582" r="0.676424" fill="black" stroke="black" stroke-
width="0.1536"></circle></g><defs><clipPath id="clip0_612_21136"><rect
width="10" height="15" fill="white"></rect></clipPath></defs></svg>
 Test your mobile apps
<a class="menu-item-app-live" href="/app-live" data-product="App Live" aria-
label="App Live"> <svg
width="36" height="34" alt="Icon for BrowserStack App Live" viewBox="0 0 35
49" version="1.1" xmlns="http://www.w3.org/2000/svg"
xmlns:xlink="http://www.w3.org/1999/xlink"> <title>Group 4</title>
<desc>Created with Sketch.</desc> <defs></defs> <g id="AppLiveSVGFinal"
stroke="none" stroke-width="1" fill="none" fill-rule="evenodd"> <g
id="AppLiveSVGCard-Hover-state-Homepage" transform="translate(-
752.000000, -1162.000000)"> <g id="AppLiveSVGProducts"
transform="translate(294.000000, 1029.000000)"> <g
id="AppLiveSVGproducts" transform="translate(26.000000, 73.000000)"> <g
id="AppLiveSVGapps" transform="translate(409.000000, 0.000000)"> <g
id="AppLiveSVGApp-live" transform="translate(23.000000, 59.000000)"> <g
id="AppLiveSVGGroup-4" transform="translate(0.000000, 1.000000)"> <g
id="AppLiveSVGiPhone-Copy-4"> <path d="M20.2666667,0 L3.73333333,0
C1.671472,0 0,1.49736033 0,3.34444444 L0,39.6555556 C0,41.5026397
1.671472,43 3.73333333,43 L20.2666667,43 C22.328528,43 24,41.5026397
24,39.6555556 L24,3.34444444 C24,1.49736033 22.328528,0 20.2666667,0 Z"
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d="M20.2666667,0 L3.73333333,0 C1.671472,0 0,1.49736033 0,3.34444444
L0,39.6555556 C0,41.5026397 1.671472,43 3.73333333,43 L20.2666667,43
C22.328528,43 24,41.5026397 24,39.6555556 L24,3.34444444 C24,1.49736033
22.328528,0 20.2666667,0 Z M21.8137652,38.7618184
C21.8137652,39.7484353 20.9688941,40.5482456 19.9266917,40.5482456
L4.07330834,40.5482456 C3.03110594,40.5482456 2.18623482,39.7484353
2.18623482,38.7618184 L2.18623482,4.23818162 C2.18623482,3.25156466
3.03110594,2.45175439 4.07330834,2.45175439 L6.86716001,2.45175439
L6.86716001,2.67505779 C6.86716001,3.23002928 7.34240061,3.67992311
7.92863887,3.67992311 L16.0666434,3.67992311 C16.652877,3.68238838
17.1302264,3.23449981 17.1328306,2.67953279 C17.1328337,2.67853835
17.1328368,2.60261221 17.13284,2.45175439 L19.9266917,2.45175439
C20.9688941,2.45175439 21.8137652,3.25156466 21.8137652,4.23818162
L21.8137652,38.7618184 Z" id="AppLiveSVGiphone-x-copy-2" fill="#2A4A68"
fill-rule="nonzero"></path> </g> <g id="AppLiveSVGdownload-copy"
transform="translate(11.000000, 25.000000)"> <path d="M12,24 C5.383125,24
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24,12 C24,18.616875 18.616875,24 12,24 Z" id="AppLiveSVGPath"

fill="#E4E2E5"></path> <path d="M12,24 C5.383125,24 0,18.616875 0,12
C0,5.383125 5.383125,0 12,0 C18.616875,0 24,5.383125 24,12 C24,18.616875
18.616875,24 12,24 Z M12,2.46428571 C6.74207526,2.46428571
2.46428571,6.74207526 2.46428571,12 C2.46428571,17.2579247
6.74207526,21.5357143 12,21.5357143 C17.2579247,21.5357143
21.5357143,17.2579247 21.5357143,12 C21.5357143,6.74207526
17.2579247,2.46428571 12,2.46428571 Z" id="AppLiveSVGShape"
fill="#142433" fill-rule="nonzero"></path> <path d="M11.5,15
C9.49654088,15 8,12.57984 8,10.41568 C8,8.3728 9.40660377,7 11.5,7
C13.5933962,7 15,8.3728 15,10.41568 C15,12.57984 13.5034591,15 11.5,15 Z"
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d="M18.8885949,20.5 C18.8616763,20.4764147 16.301462,24 11.5,24
C6.73356904,24 4.26849161,20.375822 4.17298599,20.4710157
L3,19.7819274 C3.11173051,19.6685475 5.80469394,17 11.3311136,17
C16.8276647,17 19.8731508,19.6404157 20,19.7526589 L18.8885949,20.5 Z"
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</g> </g> </g> </g> </g> </g> </g></svg> <div class="dropdown-
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native & hybrid app testing   <a class="menu-item-
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label="App Automate"> <div class="menu-icon-holder menu-icon-app-
automate"> <svg width="36" height="34" alt="Icon for BrowserStack App
Automate" viewBox="0 0 45 50" version="1.1"
xmlns="http://www.w3.org/2000/svg"
xmlns:xlink="http://www.w3.org/1999/xlink"> <title>App automate icon</title>
<desc>Created with Sketch.</desc> <defs></defs> <g id="Final"
stroke="none" stroke-width="1" fill="none" fill-rule="evenodd"> <g id="Card-
Hover-state-Homepage" transform="translate(-750.000000, -1306.000000)">
<g id="Products" transform="translate(294.000000, 1029.000000)"> <g
id="products" transform="translate(26.000000, 73.000000)"> <g id="apps"
transform="translate(409.000000, 0.000000)"> <g id="app-automate"
transform="translate(21.000000, 204.000000)"> <g id="App-automate-icon">
<g id="iPhone-Copy-3"> <g transform="translate(0.000000, 5.677419)">
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2.86481481,34.0645161 L15.5518519,34.0645161 C17.1340441,34.0645161
18.4166667,32.8783102 18.4166667,31.4150538 L18.4166667,2.64946237
C18.4166667,1.18620594 17.1340441,0 15.5518519,0 Z" id="Path-Copy-3"
fill="#A1DBFE"></path> <path d="M15.5518519,0 L2.86481481,0
C1.28262261,0 0,1.18620594 0,2.64946237 L0,31.4150538 C0,32.8783102
1.28262261,34.0645161 2.86481481,34.0645161 L15.5518519,34.0645161
C17.1340441,34.0645161 18.4166667,32.8783102 18.4166667,31.4150538
L18.4166667,2.64946237 C18.4166667,1.18620594 17.1340441,0
15.5518519,0 Z M16.7390351,30.7070369 C16.7390351,31.488633
16.0907138,32.1222411 15.2909683,32.1222411 L3.12569842,32.1222411
C2.32595282,32.1222411 1.67763158,31.488633 1.67763158,30.7070369
L1.67763158,3.35747921 C1.67763158,2.57588318 2.32595282,1.94227504
3.12569842,1.94227504 L5.26959154,1.94227504 L5.26959154,2.11917556
C5.26959154,2.55882289 5.63427269,2.91522791 6.08412913,2.91522791
L12.3289174,2.91522791 C12.7787702,2.91718089 13.1450696,2.56236444
13.1470679,2.12272065 C13.1470703,2.12193285 13.1470727,2.06178432
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11.5939424,44 13.662963,44 L30.2537037,44 C32.3227243,44 34,42.4678173
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13.662963,44 L30.2537037,44 C32.3227243,44 34,42.4678173 34,40.5777778
L34,3.42222222 C34,1.53218267 32.3227243,0 30.2537037,0 Z
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12.1104926,40.6728176 12.1104926,39.663256 L12.1104926,4.33674398
C12.1104926,3.32718244 12.9582973,2.50877193 14.0041184,2.50877193
L16.807671,2.50877193 L16.807671,2.73726844 C16.807671,3.30514624
17.2845617,3.76550272 17.8728355,3.76550272 L26.0390971,3.76550272
C26.6273661,3.76802532 27.106373,3.30972074 27.1089862,2.74184751
C27.1089894,2.74082994 27.1089925,2.66313808 27.1089957,2.50877193
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39.6735766,39.2954573 36.9330135,42.0292478 C34.1924505,44.671912
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C39.5773514,36.1402281 39.5773514,39.9675348 37.2282973,42.3107839
C34.8792432,44.5759246 31.042455,44.5759246 28.6934009,42.2326756 Z
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C40.3460961,27.6355422 39.8205706,27.6355422 39.5195195,27.936747
L38.1689189,29.2168675 C37.0427928,28.4638554 35.8415916,27.936747
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C29.3843844,28.0120482 28.1839339,28.4638554 27.0578078,29.2168675
L25.6306306,27.8614458 C25.3310811,27.560241 24.8055556,27.560241
24.5045045,27.8614458 L22.9286787,29.4427711 C22.6276276,29.7439759
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C23.4542042,33.0572289 22.9286787,34.2620482 22.7034535,35.5421687
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25.5563063,47.063253 L26.9076577,45.7831325 C28.0337838,46.5361446
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C30.5105105,49.623494 30.8858859,50 31.3370871,50 L33.5893393,50
C34.0397898,50 34.4151652,49.623494 34.4151652,49.1716867
L34.4151652,47.2891566 C35.6914414,46.9879518 36.8918919,46.5361446

38.018018,45.7831325 L39.3693694,47.2138554 C39.6704204,47.5150602
40.1959459,47.5150602 40.4954955,47.2138554 L42.0728228,45.6325301
C42.3723724,45.3313253 42.3723724,44.8042169 42.0728228,44.503012
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44.6246246,35.6174699 44.1749249,35.6174699 L42.298048,35.6174699 Z"
id="Fill-1-Copy" fill="#142433"></path> </g> </g> </g> </g> </g> </g>
</g></svg>   App Automate
  Test automation for native &
hybrid mobile apps
 Use BrowserStack with your favourite products. See our <a class="menu-
item-integration" href="/integrations" aria-
label="Integrations">Integrations ⟶
  <ul class="dropdown-section tools">
<li class="section-head section-head-new enterprise-section-head"> <span
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1.756 1.76-1.878 3.06.068-.014.149-.014.23-.014 1.149 0 2.081.964 2.081 2.152
0 .6-.243 1.145-.622 1.536a3.767 3.767 0 0 0 2.163.685c.797 0 1.54-.251
2.162-.685a2.155 2.155 0 0 1-.622-1.536c-.013-1.188.919-2.152 2.054-
2.152z"></path> <path d="M5 2.752c.73 0 1.338-.614 1.338-1.383C6.338.601
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0-1.338.614-1.338 1.383 0 .754.595 1.383 1.338 1.383.73 0 1.338-.615 1.338-
1.383-.014-.755-.608-1.383-1.338-1.383zM8.608 5.896c-.73 0-1.338.614-1.338
1.383 0 .754.595 1.383 1.338 1.383.73 0 1.338-.615 1.338-1.383 0-.755-.595-
1.383-1.338-1.383z"></path> </g></svg> <span class="section-
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Icon" width="15" height="15" fill="none" xmlns:v="https://vecta.io/nano"><g
clip-path="url(#A)" fill="#000"><path fill-rule="evenodd" d="M12.46
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0 .739-.395c.202-.202.339-.459.395-.739s.027-.57-.082-.833-.294-.489-.531-.647
zm-2.137-.8c.395-.264.86-.405 1.336-.405.638 0 1.249.253 1.7.704s.704
1.062.704 1.7c0 .475-.141.94-.405 1.336s-.64.703-1.079.885-.923.23-
1.389.137-.895-.322-1.231-.658-.565-.765-.658-1.231-.045-.95.137-
1.389.49-.815.885-1.079zm1.335 5.364h.962c.637.001 1.248.254
1.699.705s.704 1.062.705 1.699v1.923h-.962V9.111c0-.382-.152-.749-.423-
1.019s-.637-.423-1.019-.423h-.962v-.962zM10.217
14.4h.962v-.962c-.001-.637-.254-1.248-.705-1.699s-1.062-.704-
1.699-.705H6.851c-.637.001-1.248.254-1.699.705s-.704 1.062-.705
1.699v.962h.962v-.962c0-.383.153-.749.423-1.02s.637-.422
1.019-.423h1.923c.382.001.749.153 1.019.423s.423.637.423 1.02v.962zm-
1.603-7.93a1.44 1.44 0 0 0-1.821.179 1.44 1.44 0 0 0-.179 1.821 1.44 1.44 0 0 0
1.481.613A1.44 1.44 0 0 0 9.227 7.95a1.44 1.44 0 0 0-.613-1.481zm-
2.137-.8c.395-.264.86-.405 1.336-.405.638 0 1.249.253 1.7.704s.704 1.062.704
1.7c0 .475-.141.94-.405 1.336s-.64.703-1.079.885-.923.23-1.389.137-.895-.322-
1.231-.658-.565-.765-.658-1.231-.045-.95.137-1.389.49-.815.885-1.079zM3.966
6.707h-.962c-.637.001-1.248.254-1.699.705S.601 8.474.6
9.111v1.923h.962V9.111c0-.382.153-.749.423-1.019s.637-.423
1.019-.423h.962v-.962zm.801-4.565a1.44 1.44 0 0 0-1.821.179 1.44 1.44 0 0

0-.179 1.821 1.44 1.44 0 0 0 1.481.613A1.44 1.44 0 0 0 5.38 3.623a1.44 1.44 0
0 0-.613-1.481zm-2.137-.8c.395-.264.86-.405 1.336-.405.638 0 1.249.253
1.7.704s.704 1.062.704 1.7c0 .475-.141.94-.405 1.336s-.64.703-
1.079.885-.923.23-1.389.137-.895-.322-1.231-.658-.565-.765-.658-
1.231-.045-.95.137-1.389.49-.815.885-1.079z"></path><path d="M12.46
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1.041h0l-.041-.041zm.395-.739l-.056-.011h0l.056.011zm-.082-.833l.053-.022h0l
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3.036l.048.032h0l-.048-.032zm-1.079.885l-.022-.053h0l.022.053zm-
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1.231l.056-.011h0l-.056.011zm3.319 2.896v-.057h0v.057zm-.962
0v-.057h-.058v.057h.058zm2.661.705l-.041.041h0l.041-.041zm.705 1.699h.057
0-.057zm0 1.923v.057h.057v-.057h-.057zm-.962 0h-.058v.057h.058v-.057zm0-
1.923h.057 0-.057zM12.62 7.669v-.057h0v.057zm-.962
0h-.058v.057h.058v-.057zm-.48 6.731v.057h.057V14.4h-.057zm-.962
0h-.057v.057h.057V14.4zm.962-.962h.057 0-.057zm-2.404-
2.404v-.057h0v.057zm-1.923 0v-.057h0v.057zm-
1.699.705l.041.041h0l-.041-.041zm-.705 1.699h-.057
0 .057zm0 .962h-.057v.057h.057V14.4zm.962
0v.057h.057V14.4h-.057zm0-.962h-.057 0 .057zm1.442-
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0h.057v-.057h-.057v.057zm-2.661.705l-.041-.041h0l.041.041zM.6
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0v.057h.057v-.057h-.057zm0-1.923h-.057 0 .057zm1.442-
1.442v-.057h0v.057zm.962 0v.057h.057v-.057h-.057zm.801-
5.526l.032-.048h0l-.032.048zM2.766
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3.036l.048.032h0l-.048-.032zm-1.079.885l-.022-.053h0l.022.053zm-
1.389.137l.011-.056h0l-.011.056zm-1.231-.658l-.041.041h0l.041-.041zm-.658-
1.231l.056-.011h0l-.056.011zm.137-
1.389l.053.022h0l-.053-.022zm9.914-.465c.274
0 .542.081.769.233l.064-.096a1.5 1.5 0 0
0-.833-.253v.115zm-.979.406c.26-.26.612-.406.979-.406v-.115a1.5 1.5 0 0 0-
1.061.439l.081.081zm-.406.979c0-.367.146-.72.406-.979l-.081-.081a1.5 1.5 0 0
0-.439 1.061h.115zm.233.769c-.152-.228-.233-.496-.233-.769h-.115a1.5 1.5 0 0
0 .253.833l.095-.064zm.622.51c-.253-.105-.469-.282-.622-.51l-.095.064a1.5 1.5
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0 0-.085-.867l-.106.044zm-.51-.622c.228.152.405.368.51.622l.106-.044a1.5 1.5
0 0 0-.552-.673l-.064.096zM11.659.88a2.46 2.46 0 0 0-

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0 0 0-.721-1.741l-.081.081c.44.44.687 1.037.687 1.659h.115zm-.415 1.368a2.46
2.46 0 0 0 .415-1.368h-.115c0 .464-.138.918-.395 1.304l.095.064zm-
1.105.907a2.46 2.46 0 0 0 1.105-.907l-.095-.064c-.258.386-.624.687-
1.053.864l.044.106zm-1.422.14a2.46 2.46 0 0 0
1.422-.14l-.044-.106c-.429.178-.901.224-1.356.134l-.022.113zm-1.26-.674a2.46
2.46 0 0 0 1.26.674l.022-.113c-.455-.091-.873-.314-
1.202-.642l-.081.081zm-.674-1.26a2.46 2.46 0 0 0 .674
1.26l.081-.081c-.328-.328-.552-.746-.642-1.201l-.113.022zm.14-1.422a2.46 2.46
0 0 0-.14 1.422l.113-.022c-.091-.455-.044-.927.134-1.356L9.384 2.4zm.907-
1.105A2.46 2.46 0 0 0 9.384 2.4l.106.044c.178-.429.478-.795.864-
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1.087-.721-1.74-.722v.115a2.35 2.35 0 0 1 1.659.688l.081-.081zm.722
1.74c-.001-.653-.26-1.278-.722-1.74l-.081.081a2.35 2.35 0 0 1 .688
1.659h.115zm0 1.923V9.111h-.115v1.923h.115zm-
1.019.057h.962v-.115h-.962v.115zm-.058-
1.981v1.923h.115V9.111h-.115zm-.406-.979c.26.26.406.612.406.979h.115a1.5
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1.019v.962h.115v-.962h-.115zm-.423
7.635h-.962v.115h.962v-.115zm-.057-.904v.962h.115v-.962h-.115zm-.688-
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1.74l-.081.081zm-1.659-.688a2.35 2.35 0 0 1 1.659.688l.081-.081c-.461-.461-
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m-.057-.904v.962h.115v-.962h-.115zm.44-1.06a1.5 1.5 0 0 0-.44
1.06h.115c0-.367.146-.719.406-.979l-.081-.081zm1.06-.44a1.5 1.5 0 0 0-
1.06.44l.081.081c.26-.26.612-.406.979-.406v-.115zm1.923
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0 .719.146.979.406l.081-.081zm.44 1.06a1.5 1.5 0 0 0-.44-
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7.812 6.284c.274 0 .542.081.769.233l.064-.096a1.5 1.5 0 0
0-.833-.253v.115zm-.979.406c.26-.26.612-.406.979-.406v-.115a1.5 1.5 0 0 0-
1.061.439l.081.081zm-.406.979c0-.367.146-.72.406-.979l-.081-.081a1.5 1.5 0 0
0-.439 1.061h.115zm.233.769c-.152-.228-.233-.496-.233-.769h-.115a1.5 1.5 0 0
0 .253.833l.096-.064zm.622.51c-.253-.105-.469-.282-.622-.51l-.096.064a1.5 1.5
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0 0 0-.552-.673l-.064.096zm-.769-1.31a2.46 2.46 0 0 0-
1.368.415l.064.096c.386-.258.84-.395 1.304-.395v-.115zm1.741.721a2.46 2.46
0 0 0-1.741-.721v.115c.622 0 1.219.247 1.659.687l.081-.081zm.721 1.741a2.46
2.46 0 0 0-.721-1.741l-.081.081c.44.44.687 1.037.687 1.659h.115zm-.415
1.368a2.46 2.46 0 0 0 .415-1.368h-.115c0 .464-.138.918-.395 1.304l.096.064zm-
1.105.907a2.46 2.46 0 0 0 1.105-.907l-.096-.064c-.258.386-.624.687-
1.053.864l.044.106zm-1.422.14a2.46 2.46 0 0 0
1.422-.14l-.044-.106c-.429.178-.901.224-1.356.134l-.022.113zm-1.26-.674a2.46

2.46 0 0 0 1.26.674l.022-.113c-.455-.091-.873-.314-
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1.26l.081-.081c-.328-.328-.552-.746-.642-1.201l-.113.022zm.14-1.422a2.46 2.46
0 0 0-.14 1.422l.113-.022c-.091-.455-.044-.927.134-1.356l-.106-.044zm.907-
1.105a2.46 2.46 0 0 0-.907 1.105l.106.044c.178-.429.478-.795.864-
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1.06h.115c0-.367.146-.719.406-.979l-.081-.081zm1.06-.44a1.5 1.5 0 0 0-
1.06.44l.081.081c.26-.26.612-.406.979-.406v-.115zm.962
0h-.962v.115h.962v-.115zm-.057-.904v.962h.115v-.962h-.115zm.057-4.75c.274
0 .542.081.769.233l.064-.096a1.5 1.5 0 0
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0 .768-.41l-.081-.081zm.379-.709c-.053.269-.185.515-.379.709l.081.081a1.5 1.5
0 0 0 .41-.768l-.113-.022zm-.079-.8c.105.253.132.532.079.8l.113.022a1.5 1.5 0
0 0-.085-.867l-.106.044zm-.51-.622c.228.152.405.368.51.622l.106-.044a1.5 1.5
0 0 0-.552-.673l-.064.096zM3.966.88a2.46 2.46 0 0 0-
1.368.415l.064.096c.386-.258.84-.395 1.304-.395V.88zm1.741.721A2.46 2.46 0
0 0 3.966.88v.115c.622 0 1.219.247 1.659.687l.081-.081zm.721 1.741a2.46
2.46 0 0 0-.721-1.741l-.081.081c.44.44.687 1.037.687 1.659h.115zm-.415
1.368a2.46 2.46 0 0 0 .415-1.368h-.115c0 .464-.138.918-.395 1.304l.096.064zm-
1.105.907a2.46 2.46 0 0 0 1.105-.907l-.096-.064c-.258.386-.624.687-
1.053.864l.044.106zm-1.422.14a2.46 2.46 0 0 0
1.422-.14l-.044-.106c-.429.178-.901.224-1.356.134l-.022.113zm-1.26-.674a2.46
2.46 0 0 0 1.26.674l.022-.113c-.455-.091-.873-.314-
1.201-.642l-.081.081zm-.674-1.26a2.46 2.46 0 0 0 .674
1.26l.081-.081c-.328-.328-.552-.746-.642-1.201l-.113.022zm.14-1.422a2.46 2.46
0 0 0-.14 1.422l.113-.022c-.091-.455-.044-.927.134-1.356L1.692 2.4zm.907-
1.105A2.46 2.46 0 0 0 1.692 2.4l.106.044c.178-.429.478-.795.864-
1.053l-.064-.096z"></path></g><defs><clipPath id="A"><path fill="#fff"
d="M0 0h15v15H0z"></path></clipPath></defs></svg> For Teams
   <a class="tools menu-item-enterprise" href="/enterprise"
aria-label="For Teams Enterprise">Enterprise <li class="section-head
section-head-new tools-section-head"> <span
class="section-head__control-icon"><svg xmlns="http://www.w3.org/2000/svg"
class="header-tools-icon" width="10" height="10" viewBox="0 0 10 10"> <path
fill="#787878" fill-rule="evenodd" d="M8.487 2.677l-.845-.896L8.765.6l-.4-.412-
1.313.177-.767.813.133 1.675-.945 1.002L3.637 1.9 4.672.814 3.904 0H2.38L0
2.488l1.524 1.616L2.57 3.007l1.835 1.958-1.213 1.273-1.535-.153-.767.814L.7
8.267l.401.424 1.113-1.18.845.885-1.112 1.18.4.424 1.301-.177.768-.814-.133-
1.686 1.179-1.238L8.654 9.48l1.057-1.12-3.182-3.385.98-1.037
1.534.165.768-.814L10 1.922l-.4-.424z"></path></svg> <span
class="section-head__icon-holder section-head__tools-icon"> <svg
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fill="#000" xmlns:v="https://vecta.io/nano"><path d="M4.179 11.484l1.995-
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0 0 0 0 .662l1.406 1.406a.47.47 0 0 0 .662 0l1.875-1.875a.47.47 0 0 0
0-.662l-.372-.372zM2.344 13.4l-.743-.743 1.212-1.212.743.743L2.344
13.4zm8.906.663c-.746-.001-1.461-.297-1.988-.825a2.82 2.82 0 0 1-.825-1.988
2.74 2.74 0 0 1 .099-.725L4.475 6.464a2.74 2.74 0 0 1-.725.099 2.8 2.8 0 0 1-
2.614-3.836l.261-.667L2.95 3.613a.48.48 0 0 0 .663 0 .47.47 0 0 0 0-.662L2.06
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4.061c.236-.065.48-.098.725-.099a2.8 2.8 0 0 1 2.326
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1.553a.48.48 0 0 0-.663 0 .46.46 0 0 0-.102.152.47.47 0 0 0 .102.511l1.553
1.553-.666.261c-.326.13-.673.197-1.024.198h0zM4.717 5.38l4.904
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0 .837.253l-.408-.408c-.131-.13-.234-.285-.305-.456s-.107-.354-.107-.538.036-.3
67.107-.538.174-.326.305-.456a1.44 1.44 0 0 1 1.989
0l.408.408c-.017-.295-.104-.582-.253-.837s-.358-.471-.607-.629-.533-.256-.827-.
283-.591.015-.865.125l-.286.112L5.38 4.717l.112-.286a1.85 1.85 0 0
0 .125-.865c-.028-.294-.125-.578-.283-.827s-.374-.457-.629-.607a1.86 1.86 0 0
0-.837-.253l.408.408c.131.131.234.286.305.456s.107.353.107.538-.036.368-.10
7.538-.174.326-.305.456a1.44 1.44 0 0 1-1.989 0l-.408-.408a1.86 1.86 0 0
0 .253.837c.15.255.358.471.607.629s.533.256.827.283.591-.015.865-.125l.286-.
112zm8.934-4.044a1.44 1.44 0 0 0-1.989 0L8.156 4.842l.663.663 3.506-
3.506a.48.48 0 0 1 .663 0 .47.47 0 0 1 0 .663L9.482 6.168l.663.663 3.506-
3.506c.264-.264.412-.622.412-.994a1.41 1.41 0 0
0-.411-.995h0z"></path></svg> Tools   <a
class="tools menu-item-screenshots" href="/screenshots" aria-label="Tools
Screenshots">Screenshots   <a class="tools menu-item-
responsive" href="/responsive" aria-label="Tools Responsive">Responsive
  <a class="tools menu-item-speedlab" href="/speedlab" aria-
label="Tools SpeedLab">SpeedLab   <div class="col-xs-
12 integration-wrapper no-pad clear"> <p
class="integration-wrapper__desc">Use Browserstack with your favourite
products.</p> <span
class="integration-wrapper__list-icon" title="Jenkins"> <svg alt="Jenkins"
width="20" height="22" viewBox="0 0 20 22" fill="none"
xmlns="http://www.w3.org/2000/svg"><path fill-rule="evenodd" clip-
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4.01052 12.8677 4.05796 12.8949 4.1085C12.9218 4.15832 12.936 4.21462
12.936 4.28571H13.064C13.064 4.19609 13.0457 4.11846 13.0076
4.04775C12.9698 3.97775 12.9145 3.91806 12.8457 3.86133L12.7643
3.9601ZM11.4807 4.23633L7.8407 1.23633L7.7593 1.3351L11.3993
4.3351L11.4807 4.23633ZM7.8 4.34971H11.44V4.22171H7.8V4.34971ZM7.736
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6.564 4.82863 6.564 4.28571H6.436C6.436 4.92137 7.06179 5.42114 7.8
5.42114V5.29314ZM11.7 5.29314H7.8V5.42114H11.7V5.29314ZM11.764
13.9286V5.35714H11.636V13.9286H11.764ZM1.3
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10.064H10V9.936H3V10.064ZM2.936 7V8H3.064V7H2.936ZM10
6.936H3V7.064H10V6.936ZM10.064 8V7H9.936V8H10.064ZM3
8.064H10V7.936H3V8.064Z" fill="black"></path></svg> <span
class="section-head__icon-text">Get Started <ul
class="dropdown-link__main"> <li class="dropdown-link__left-item"> <a
class="menu-item-localtest" href="/docs/local-testing" aria-label="Test your
local websites" title="Test your local websites">Test your local websites
 <li class="dropdown-link__left-item"> <a class="menu-item-selenium"
href="/docs/automate/selenium/getting-started/python" aria-label="Run
Selenium Tests" title="Run Selenium Tests">Run Selenium Tests <li
class="dropdown-link__left-item"> <a class="menu-item-appium"
href="/docs/app-automate/appium/getting-started/python" aria-label="Run
Appium Tests" title="Run Appium Tests">Run Appium Tests
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fill="black"></path><path d="M16.0625
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1.59375V13.4062C0.312899 13.7542 0.451309 14.0878 0.697364
14.3339C0.943418 14.5799 1.27703 14.7184 1.625 14.7188H17.375C17.723
14.7183 18.0565 14.5799 18.3026 14.3338C18.5486 14.0878 18.687 13.7542
18.6875 13.4062V1.59375C18.6871 1.24578 18.5487 0.912168 18.3026
0.666114C18.0566 0.420059 17.723 0.281649 17.375 0.28125ZM1.625
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 <ul class="dropdown-link__main"> <li
class="dropdown-link__list"> <a class="dropdown-link__list-item menu-item-
documentation" href="/docs" aria-label="Documentation"> <span

class="dropdown-link__heading"> Documentation   Get Step by Step developer guides to test your web & mobile apps   <li class="dropdown-link__list"> Support   Get answers to all your questions related to Browserstack   <li class="dropdown-link__list"> Test University Beta   Master the fundamentals of software testing   <li class="dropdown-link__list"> Release Notes   Latest feature releases & platform updates   <ul class="dropdown-link__main"> <li class="dropdown-link__list"> Open Source   Get Free Unlimited Testing for open source projects   <li class="dropdown-link__list"> Status - Uptime   Check the status of Browserstack products   <li class="dropdown-link__list"> Events   Stay updated on all the latest Browserstack events & webinars   <li class="dropdown-link__list"> Champions   Learn more with the thought leaders & experts from across the globe   <li class="developers-menu-control">Documentation <li class="developers-menu-control">Support <li class="developers-menu-control">Status <li class="developers-menu-control">Release Notes <li class="developers-menu-control">Open Source <li class="developers-menu-control">Events <li class="developers-menu-control">Test UniversityBeta <li class="developers-menu-control">Champions   Live for Teams Pricing   </nav> <nav id="primary-menu-container" class="col-xs-12 col-md-4 col-lg-7 col-xl-7 primary-

menu-container primary-menu-container__VWO-exp fixed no-pad pull-right" aria-label="Primary Menu CTA"> <ul class="pull-right horizontal-list bs-collapse primary-menu" id="primary-menu"> <li class="dropdown-holder clear"> <button class="product-dropdown-toggle dropdown-toggle-mobile hide-md hide-lg hide-xl forward" id="product-menu-toggle-responsive" data-trigger="product-responsive" aria-label="Products">Products</button> <li class="dropdown-holder clear"> <button class="developers-dropdown-toggle dropdown-toggle-mobile hide-md hide-lg hide-xl forward" id="developers-menu-toggle-responsive" data-trigger="developers-responsive" aria-label="Developers">Developers</button> <li class="hide-md hide-lg hide-xl">Live for Teams <li class="hide-md hide-lg hide-xl"> Pricing <li class="sign-in-link hide-xs hide-sm"> Sign in <li class="free-trial-btn hide-xs hide-sm"> Free Trial <li class="go-to-dashboard free-trial-btn hide-xs hide-sm"> Go to Dashboard <li class="hide-md hide-lg hide-xl"> Sign in <li class="free-trial-link hide-md hide-lg hide-xl"> Free Trial <li class="hide-sm hide-xs"> <button class="doc-search-menu dropdown-toggle doc-search-cta doc-search-menu-icon doc-menu-toggle" aria-label="Search"></button>   <ul class="product-menu-dropdown-responsive mobile-dropdown-menu dropdown-section col-xs-12 no-pad hide clear primary hide-md hide-lg hide-xl" data-target="product-responsive" id="product-responsive"> <li class="section-title back" data-target="primary"> <button id="product-close-cta" class="cta" aria-label="Close product sub menu">Products</button> <li class="section-head"> Test your websites   Live   Interactive cross browser testing   Automate   Selenium testing at scale   Percy   Visual testing & review   <li class="section-head"> Test your mobile apps   App Live   Interactive native & hybrid app testing   App Automate   Test automation for native & hybrid mobile apps   <li class="section-head"> For Teams   Enterprise <li class="section-head"> Tools   Screenshots   Responsive   SpeedLab

<ul class="developers-menu-dropdown-responsive mobile-dropdown-menu dropdown-section col-xs-12 no-pad hide clear primary hide-md hide-lg hide-xl" data-target="developers-responsive" id="developers-responsive"> <li class="section-title back" data-target="primary"> <button id="developer-close-cta" class="cta" aria-label="Close developer sub menu"> Developers</button>   Documentation   Support   Status   Release Notes   Open Source   Events   Test University   Champions   </nav>   <nav class="ds__top-bar">   <form action="/search" method="get" role="search" class="ais-SearchBox-form" onsubmit="return validateSearchForm()"> <input class="ais-SearchBox-input" id="doc-search-box-input" name="query" type="search" placeholder="Search across browserstack.com" autocomplete="off" autocorrect="off" autocapitalize="off" maxlength="512" autofocus="" aria-label="Search across browserstack.com"> <input type="hidden" value="all" name="type"> <button class="ds__input__handle--btn ds__input__handle--reset" type="reset" title="Clear the search query." role="button"> <img class="b-lazy b-lazy-hidden ds__input__handle--btn__clear-image ds__input_handle__clear-image" src="" data-lazy-type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/docs-search/ic-clear.svg" width="20" height="20" alt="Clear"><noscript></noscript> </button> <button class="ds__input__handle--btn ds__input__handle--submit" type="submit" title="Submit the search query." role="button"> Press </button> </form>   <button aria-label="Close Search Filter" class="ds--close"></button> </nav> <nav class="tax-category__nav clear page-wrapper-on-load single-guide-page hide-md hide-lg hide-xl" id="guide-cat-nav">   <img alt="BrowserStack logo" id="category-header-logo" class="b-lazy b-lazy-hidden tax-category__nav--title-logo" height="31" src="" data-lazy-

type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/bstack-logo.svg" width="31"><noscript><img alt="BrowserStack logo" id="category-header-logo" class="tax-category__nav--title-logo" height="31" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/bstack-logo.svg" width="31"></noscript> Guide Categories   <form action="/search" method="get" role="search" class="tax-category-search__form" onsubmit="return validateDocSearchForm()"> <input class="tax-category-search__input" id="tax-category-search-input" name="query" type="search" placeholder="Search across Guide" autocomplete="off" autocorrect="off" autocapitalize="off" maxlength="512"> <input type="hidden" value="guides" name="type"> <input type="hidden" value="guides" name="referrer">   Press /   <button class="tax-category-search__input-handle--reset" type="reset" title="Clear the search query."> <img class="b-lazy b-lazy-hidden clear-input" alt="Clear search" src="" data-lazy-type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/docs-search/ic-clear.svg" width="20" height="20" loading="lazy"><noscript><img class="clear-input" alt="Clear search" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/docs-search/ic-clear.svg" width="20" height="20" loading="lazy"></noscript> </button> <button class="tax-category-search__input-handle--submit" type="submit" title="Submit the search query."> Press </button> </form>   <ul id="menu-guide-category" class="horizontal-list tax-category__nav--menu-ul"><li id="menu-item-29405" class="menu-item menu-item-type-post_type menu-item-object-page menu-item-29405 nav-item">Home
<li id="menu-item-29410" class="menu-item menu-item-type-taxonomy menu-item-object-guide-category current-guide-ancestor current-menu-parent current-guide-parent active menu-item-29410 nav-item menu-item-primary-category">Testing on Cloud
<li id="menu-item-29409" class="menu-item menu-item-type-taxonomy menu-item-object-guide-category current-guide-ancestor current-menu-parent current-guide-parent active menu-item-29409 nav-item">Debugging
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Practices" href="/guide/category/best-practices" class="nav-link" aria-label="Best Practices">Best Practices
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<li id="menu-item-29412" class="menu-item menu-item-type-taxonomy menu-item-object-guide-category menu-item-29412 nav-item">Tutorials   <ul id="category-header-cta" class="horizontal-list tax-category__nav--cta-ul"> GET A DEMO <li class="tax-category__nav--cta-trial-link"> Free Trial   </nav> </header> <main role="main" id="main-content" class="page-template-page-raw-text page-wrapper-on-load"> <section id="post-24497" class="post-24497 guide type-guide status-publish has-post-thumbnail hentry guide-tags-cross-browser-testing guide-tags-emulator-and-simulator guide-tags-manual-testing guide-tags-mobile-app-testing guide-category-debugging guide-category-testing-on-cloud"> <div id="guideBannerSection" class="guide-banner-section " data-lazy-ratina="background-image: url('https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/guide-banner-image@2x.jpg');" data-lazy-style="background-image: url('https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/guide-banner-image@1x.jpg');">   App & Browser Testing Made Easy Give your users a seamless experience by testing on 3000+ real devices and browsers. Don't compromise with emulators and simulators   Get Started free   <article class="raw-text-habitat clear " id="singlePageArticle">   Home Guide How to inspect element on iPhone <h1>How to inspect element on iPhone</h1> By Jash Unadkat, Technical Content Writer at BrowserStack - May 13, 2022   <ul class="social-share__list"> <li class="social-share__list-item"><a title="Share on LinkedIn" href="https://www.linkedin.com/shareArticle?url=https%3A%2F%2Fwww.browserstack.com%2Fguide%2Fhow-to-inspect-element-on-iphone" onclick="window.open(this.href, 'guideshare','left=50,top=50,width=800,height=400,toolbar=0'); return false;"

class="social-share__link custom-btn-amp-events" data-btn-eventname="SocialSharingIcon" data-btn-ampjson="{"platform":"LinkedIn","position":"Top"}"><img class="b-lazy social-share__image b-lazy-loaded" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/linked-in.svg" data-lazy-type="image" data-id="0" width="30" height="30" alt="LinkedIn"><noscript><img class="b-lazy b-lazy-hidden social-share__image" src="" data-lazy-type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/linked-in.svg" width="30" height="30" alt="LinkedIn"><noscript><img class="social-share__image" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/linked-in.svg" width="30" height="30" alt="LinkedIn"></noscript> <li class="social-share__list-item"><img class="b-lazy social-share__image b-lazy-loaded" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/facebook.svg" data-lazy-type="image" data-id="0" width="30" height="30" alt="Facebook"><noscript><img class="b-lazy b-lazy-hidden social-share__image" src="" data-lazy-type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/facebook.svg" width="30" height="30" alt="Facebook"><noscript><img class="social-share__image" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/facebook.svg" width="30" height="30" alt="Facebook"></noscript> <li class="social-share__list-item"><img class="b-lazy social-share__image b-lazy-loaded" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/twitter.svg" data-lazy-type="image" data-id="0" width="30" height="30" alt="Twitter"><noscript><img class="b-lazy b-lazy-hidden social-share__image" src="" data-lazy-type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-

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%2Fwww.browserstack.com%2Fguide%2Fhow-to-inspect-element-on-iphone"
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class="vc_column-inner"> <div
class="wpb_text_column wpb_content_element ">
In a constant endeavor to provide optimized performance across mobile
devices, developers strive to <a title="How to create a Responsive Website"
href="https://www.browserstack.com/guide/how-to-create-responsive-website"
target="_blank" rel="noopener">build responsive websites. However, while
doing so, developers might face multiple challenges. For example, a
developer might encounter a specific rendering issue that seems to occur on a
specific iPhone while creating a <a title="Responsive Web Design"
href="https://www.browserstack.com/responsive-design">responsive
design for a website. In such cases, they need to inspect specific web
elements on real devices to figure out the exact solution. Here’s where QAs and
developers need to be aware of handy solutions that can help save time spent on
troubleshooting. This article aims to explain two easy methods for
inspecting elements on an iPhone. <span
class="guide-toc__heading">Table of Contents <div class="guide-
toc__list">
Different Ways to
Inspect Element on iPhone Devices
<a class="cta-scroll"
href="#toc0">Using iPhone Devices
on BrowserStack
Using Safari
developer tools to inspect elements on an actual device
<a
class="cta-scroll" href="#toc3">Debug using the Web Inspector feature on
iPhones or iPads
Inspect using
Adobe Edge <h3
id="toc0">Different Ways to Inspect Element on iPhone

Devices</h3> Listed below are the different ways to inspect elements on any iPhone devices Using iPhone Devices on BrowserStack
Using Safari developer tools to inspect elements on an actual device
Debug using the Web Inspector feature
Adobe Edge Inspect
<h4 id="toc1">Using iPhone Devices on BrowserStack</h4> BrowserStack is a cloud-based platform that allows web-developers to test their web apps instantly for cross browser compatibility across a range of devices. Its real device cloud enables developers or QAs to instantly run manual tests on real mobile and desktop devices. For extensive testing, QAs can also use its Cloud Selenium Grid for automated cross browser testing on multiple real devices. Developers also get instant access to Dev tools on both platforms (Android and iOS) during live testing. This allows developers to eliminate their testing pain points as they can instantly test websites across a variety of iOS devices like iPhone X, iPhone, iPhone 11 Pro, and many other earlier versions on desired browsers. Try Inspect Element on Real iPhone for Free The image below represents a sample BrowserStack Live session running on Safari – iPhone XS <img class="b-lazy aligncenter wp-image-24500 size-large b-lazy-loaded" title="How to Inspect element on iPhone" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-700x423.png" data-lazy-type="image" data-id="0" alt="How to Inspect element on iPhone " width="700" height="423" srcset="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-700x423.png 700w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-250x151.png 250w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-768x464.png 768w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-120x73.png 120w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-640x387.png 640w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-320x193.png 320w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM.png 1110w" sizes="(max-width: 700px) 100vw, 700px"><noscript><img class="aligncenter wp-image-24500 size-large" title="How to Inspect element on iPhone" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-700x423.png" alt="How to Inspect element on iPhone " width="700" height="423" srcset="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-700x423.png 700w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-

content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-250x151.png 250w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-768x464.png 768w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-120x73.png 120w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-640x387.png 640w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM-320x193.png 320w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-09-at-2.36.25-PM.png 1110w" sizes="(max-width: 700px) 100vw, 700px"/></noscript> One can inspect an element on iPhone in 3 simple steps – Sign up for Free on BrowserStack Live
Select the desired iPhone device to inspect on
Click on Dev Tools to start inspecting. As web developers get upfront access to the DevTools in the dashboard, inspecting specific elements on any iPhone becomes much easier for them. Developers have multiple real mobile devices to choose from and can switch between device-browser-OS combinations at any point. This ensures web-developers or QAs can quickly troubleshoot any rendering issues and fix them with minimal time and effort. Also Read: How to Inspect an Element on Mac <h4 id="toc2">Using Safari developer tools to inspect elements on an actual device</h4> Apple provides a very intuitive feature that enables web developers to debug and inspect web elements on actual iPads and iPhones. One just needs to connect their iPhone and enable the Web Inspector to get started. Read More: How to request a desktop site on the iPhone Enable the Web Inspector on your iOS mobile device by: Going to Settings > Safari > Scroll down to the bottom > Open Advanced Menu> Turn on the Web Inspector Note: This feature only works on the actual Apple Mac and not on Safari running on Windows. One just needs to enable the “Show Develop menu in the menu bar”. The steps to do so are as follows: Open Safari browser
Click on Safari > Preferences > Advanced
Tick the checkbox Show Develop menu in the menu bar <img loading="lazy" class="b-lazy aligncenter wp-image-24498 size-large b-lazy-loaded" title="How to Inspect element on iPhone" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-06-at-6.52.53-PM-700x411.png" data-lazy-type="image" data-id="0" alt="How to Inspect element on iPhone " width="700" height="411" srcset="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-06-at-6.52.53-PM-700x411.png

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 Once done, the Develop menu will be enabled in the top-bar. Click on the Develop menu and it will show the connected iPhone in the options along with the web-page that is active on the connected device. Click on that page and it will open the Web inspector window for the same page. <img loading="lazy" class="b-lazy aligncenter wp-image-24499 size-full b-lazy-loaded" title="How to Inspect element on iPhone" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-06-at-7.05.51-PM.png" data-lazy-type="image" data-id="24499" alt="How to Inspect element on iPhone " width="606" height="346" srcset="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-06-at-7.05.51-PM.png 606w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-06-at-7.05.51-PM-250x143.png 250w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-06-at-7.05.51-PM-120x69.png 120w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-06-at-7.05.51-PM-320x183.png 320w" sizes="(max-width: 606px) 100vw, 606px"><noscript><img loading="lazy" class="aligncenter wp-image-24499 size-full" title="How to Inspect element on iPhone" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/

uploads/2020/03/Screenshot-2020-03-06-at-7.05.51-PM.png" alt="How to Inspect element on iPhone " width="606" height="346" srcset="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-06-at-7.05.51-PM.png 606w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-06-at-7.05.51-PM-250x143.png 250w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-06-at-7.05.51-PM-120x69.png 120w, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/03/Screenshot-2020-03-06-at-7.05.51-PM-320x183.png 320w" sizes="(max-width: 606px) 100vw, 606px"/></noscript> When you interact with any element in the web inspector, it immediately highlights that particular element on the iPhone in real-time. This helps developers identify exactly what they are inspecting as they continue to interact with the elements providing an interactive test experience. <h4 id="toc3">Debug using the Web Inspector feature on iPhones or iPads</h4> Apple has a web inspector feature that allows developers and testers to debug their web pages from their mobile phones. Before, we see how to inspect elements on iPhone using this option, let us take a look at the requirements. To perform this,you will need two things. Your deployment machine
The device on which you want to test the webpage or app. Getting all the devices on which you want to inspect and test is quite a difficult task. This is as good as maintaining an in house device library. But, the problem with maintaining one is the high setup and maintenance cost that it comes with. You will have to ensure that the devices are updated, and well maintained. And, even if you were to do that, you will be able to test one version of the browser. What would you do if you want to test an older version? Also Read: Remote Debugging on iOS and Mac Safari These are a few fallbacks with this method. However, BrowserStack overcomes all these issues by providing you with a real device cloud, that allows you to access any device and version that you want. That said, we have listed the detailed steps to debug using the web inspector feature on iPhones or iPads in this article. Please head over to the above link to know more. <h4 id="toc4">Inspect using Adobe Edge</h4> Adobe Edge Inspect is one of the easy methods to inspect elements on any iPhone device. Adobe has discontinued this feature, but you can find the source for this on the internet. Therefore using this poses a security threat and should be used with discretion. The user using this would be liable for any data leak or security concerns. Adobe Edge Inspect does not require a mac operating system and can be accessed from windows as well. As it supports synchronized browsing the web page that you open will be synced with all the devices that are connected to the system. Adobe Edge inspect does not support local testing. Learn how to test Local Website on mobile. Now let us see how to use Adobe Edge Inspect: Download their software on the deployment system and

ensure that all the devices that you want to test are connected to the same wifi. The sync happens by establishing the connection via wifi. Next, open the website. You will notice that the website opens up on all the devices that are connected to the deployment machine. There will be a debug sign next to the device name.
Select the debug sign for the device you want to inspect.
You will now have access to the developer tools and can start inspecting. Given all the four options and the concerns associated with it, it is best to choose BrowserStack to inspect elements on your iPhone. Sign up and start testing for free. <hr> Also read: How to test mobile applications manually <hr> BrowserStack also provides a Responsive checker that lets users view their websites on multiple mobile and desktop devices in order to verify the site’s responsive design. It’s very important for web developers and QAs to be aware of techniques that can help them resolve critical UI bugs occurring on specific devices. The methods explained above will help them trace bugs quickly and ensure the faster release of optimized websites.   Is your Website Responsive across all devices? Check what your customers see, with our FREE Responsive Checker Tool. <form class="in-content-responsive-checker" data-formname="ResponsiveChecker" method="post" action="">   <input autocomplete="off" class="text input-md input-primary input-margin" name="url" placeholder="https://www.yourwebpage.com" type="text">   <input class="btn-md btn-primary" data-btndisabled="Sending..." data-btntext="Check" name="commit" type="submit" value="Check"> </form>   Was this post useful?   Yes, Thanks Not Really   <h4 class="feedback__neg-feedback--h4">We're sorry to hear that. Please share your feedback so we can do better</h4> <textarea id="additional-info" class="feedback__neg-feedback--textarea" name="additional-info" placeholder="What were you looking for in this page? Any suggestions to make this page better?"></textarea> <input type="button" id="submitVerboseFeedback" class="btn btn-primary" value="Submit">

Thanks a lot for your feedback!   <ul class="social-share__list"> <li class="social-share__list-item"><img class="b-lazy b-lazy-hidden social-share__image" src="" data-lazy-type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/linked-in.svg" width="30" height="30" alt="LinkedIn"><noscript><img class="b-lazy b-lazy-hidden social-share__image" src="" data-lazy-type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/linked-in.svg" width="30" height="30" alt="LinkedIn"><noscript><img class="social-share__image" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/linked-in.svg" width="30" height="30" alt="LinkedIn"></noscript> <li class="social-share__list-item"><img class="b-lazy b-lazy-hidden social-share__image" src="" data-lazy-type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/facebook.svg" width="30" height="30" alt="Facebook"><noscript><img class="b-lazy b-lazy-hidden social-share__image" src="" data-lazy-type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/facebook.svg" width="30" height="30" alt="Facebook"><noscript><img class="social-share__image" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/guide/facebook.svg" width="30" height="30" alt="Facebook"></noscript> <li class="social-share__list-item"><a title="Share on twitter" href="https://twitter.com/share?url=https%3A%2F%2Fwww.browserstack.com%2Fguide%2Fhow-to-inspect-element-on-iphone&text=How to inspect element on iPhone&via=browserstack" onclick="window.open(this.href, 'guideshare','left=50,top=50,width=800,height=400,toolbar=0'); return false;"

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ampjson="{"name":"emulator-and-simulator","position":"bottom"}" title="Emulator and Simulator">Emulator and Simulator Manual Testing Mobile App Testing   <h3 class="section-title col-xs-12 col-sm-12 col-md-12 col-lg-12">Related Articles</h3>   <article class="related-article"> <img src="" data-lazy-type="image" data-id="23281" data-lazy-mob-srcset="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/01/mobile-usability-testing-640x578.png 1x, https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/01/mobile-usability-testing-768x694.png 2x" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/01/mobile-usability-testing.png" alt="get the most out of mobile usability tests" title="mobile usability testing" width="294" height="266" class="b-lazy b-lazy-hidden attachment-post-thumbnail size-post-thumbnail wp-post-image"><noscript><img src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/uploads/2020/01/mobile-usability-testing.png" alt="get the most out of mobile usability tests" title="mobile usability testing" width="294" height="266" class="attachment-post-thumbnail size-post-thumbnail wp-post-image"></noscript>   <h3>How to run Mobile Usability Tests for the best results</h3> For a business, nothing is more important than ensuring that its mobile apps are flawless (or as clo... Learn More </article>   <article class="related-article"> <a href="https://www.browserstack.com/guide/how-to-install-ipa-on-iphone" title="How to install .ipa test file on iPhone" class="custom-btn-amp-events

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<li id="menu-item-26871" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-26871">Percy New!
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<li id="menu-item-65" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-65">Responsive
<li id="menu-item-559" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-559">Enterprise
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<li id="menu-item-25038" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25038">Customers
<li id="menu-item-25039" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25039">Careers We’re hiring!
<li id="menu-item-25040" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25040">Open Source
<li id="menu-item-25041" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25041">Partners
<li id="menu-item-25042" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25042">Press
<li id="menu-item-25043" class="custom-footer-contact-link custom-footer-contact-btn menu-item menu-item-type-custom menu-item-object-custom menu-item-25043">Contact   <a class="brand custom-btn-amp-events" title="BrowserStack Logo" href="/" data-btn-eventname="ClickedOnFooter" data-btn-ampjson="{"value":"BrowserStack Logo"}"> <svg alt="Header logo" class="w-svg" width="219" version="1.1" id="browserstack_logo" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" viewBox="-1076.1 758.6 202.1 43.6" style="enable-background:new -1076.1 758.6 202.1 43.6;" xml:space="preserve"><style type="text/css"> .st0{fill:#F4B960;} .st1{fill:#E66F32;} .st2{fill:#E43C41;} .st3{fill:#BDD041;} .st4{fill:#6DB54C;} .st5{fill:#AEDAE6;} .st6{fill:#56B8DE;} .st7{fill:#00B1D5;} .st8{fill:url(#XXMLID_2_);} .st9{fill:#221F1F;} .st10{fill:#FFFFFF;}</style><g> <g id="XXMLID_57_"> <circle id="XXMLID_68_" class="st0" cx="-1054.3" cy="780.4" r="21.7"></circle> <circle id="XXMLID_67_" class="st1" cx="-1056.5" cy="778.2" r="19.6"></circle> <circle

id="XXMLID_66_" class="st2" cx="-1053.8" cy="775.7" r="17"></circle>
<circle id="XXMLID_65_" class="st3" cx="-1052.5" cy="777"
r="15.6"></circle> <circle id="XXMLID_64_" class="st4" cx="-1053.6"
cy="778.2" r="14.5"></circle> <circle id="XXMLID_63_" class="st5" cx="-
1055.9" cy="775.8" r="12.1"></circle> <circle id="XXMLID_62_" class="st6"
cx="-1054" cy="773.8" r="10.2"></circle> <circle id="XXMLID_61_"
class="st7" cx="-1052.7" cy="775.2" r="8.9"></circle> <radialGradient
id="XXMLID_2_" cx="-1053.988" cy="-164.5" r="7.661"
gradientTransform="matrix(1 0 0 -1 0 611.9999)"
gradientUnits="userSpaceOnUse"> <stop offset="0" style="stop-
color:#797979"></stop> <stop offset="1"
style="stop-color:#4C4C4C"></stop> </radialGradient> <circle
id="XXMLID_60_" class="st8" cx="-1054" cy="776.4" r="7.6"></circle> <circle
id="XXMLID_59_" class="st9" cx="-1054" cy="776.4" r="7.6"></circle>
<ellipse id="XXMLID_58_" transform="matrix(0.4094 -0.9124 0.9124 0.4094 -
1326.5503 -501.9048)" class="st10" cx="-1050.9" cy="773.6" rx="2.4"
ry="1.5"></ellipse> </g> <path id="XXMLID_53_" class="st10" d="M-
1025.5,772.2c0-0.1,0.1-0.3,0.3-0.3h6.9c3.9,0,5.7,1.8,5.7,4.5c0,2-1,3-2.2,3.6v0.1
c1.1,0.4,2.5,1.8,2.5,3.9c0,3.4-2.3,5-6.3,5h-6.6c-0.1,0-0.3-0.1-0.3-0.3C-
1025.5,788.7-1025.5,772.2-1025.5,772.2z M-1018.4,779 c1.6,0,2.6-0.9,2.6-
2.2c0-1.4-1-2.3-2.6-2.3h-3.7c-0.1,0-0.1,0.1-0.1,0.1v4.2c0,0.1,0.1,0.1,0.1,0.1 C-
1022.2,779-1018.4,779-1018.4,779z M-1022.2,786.2h3.9c1.8,0,2.8-0.9,2.8-2.4s-
1-2.4-2.8-2.4h-3.9c-0.1,0-0.1,0.1-0.1,0.1v4.4 C-1022.4,786.2-1022.2,786.2-
1022.2,786.2z"></path> <path id="XXMLID_51_" class="st10" d="M-
1010.1,788.8c-0.1,0-0.3-0.1-0.3-0.3v-11.6c0-0.1,0.1-0.3,0.3-0.3h2.5
c0.1,0,0.3,0.1,0.3,0.3v1h0.1c0.6-0.9,1.8-1.6,3.4-
1.6c1,0,2.1,0.4,2.7,1c0.1,0.1,0.1,0.3,0.1,0.3l-1.4,1.7 c-0.1,0.1-0.3,0.1-0.4,0.1c-
0.6-0.3-1.2-0.6-2-0.6c-1.7,0-2.5,1.1-2.5,3.1v6.5c0,0.1-0.1,0.3-0.3,0.3L-
1010.1,788.8L-1010.1,788.8z "></path> <path id="XXMLID_48_" class="st10"
d="M-1000.6,785.8c-0.3-0.8-0.5-1.6-0.5-3c0-1.4,0.1-2.2,0.5-3c0.8-2.2,2.7-
3.3,5.4-3.3 c2.7,0,4.6,1.2,5.4,3.3c0.3,0.8,0.5,1.6,0.5,3c0,1.4-0.1,2.2-0.5,3c-
0.8,2.2-2.7,3.3-5.4,3.3C-997.9,789.1-999.9,788-1000.6,785.8z M-
992.7,785.1c0.3-0.6,0.3-1.2,0.3-2.2s-0.1-1.6-0.3-2.2c-0.4-1-1.2-1.6-2.5-1.6c-
1.2,0-2.1,0.6-2.5,1.6c-0.3,0.7-0.3,1.2-0.3,2.2
s0.1,1.6,0.3,2.2c0.4,1,1.2,1.6,2.5,1.6C-994,786.7-993.2,786.1-
992.7,785.1z"></path> <path id="XXMLID_46_" class="st10" d="M-
976.3,788.8c-0.1,0-0.3-0.1-0.3-0.3l-2.5-7.8h-0.1l-2.5,7.7c-0.1,0.1-0.1,0.3-
0.3,0.3h-2.2 c-0.1,0-0.3-0.1-0.3-0.3l-4.1-11.6c-0.1-0.1,0.1-0.3,0.2-
0.3h2.6c0.2,0,0.3,0.1,0.3,0.3l2.5,8h0.1l2.5-8c0.1-0.1,0.2-0.3,0.3-0.3h2
c0.1,0,0.3,0.1,0.3,0.3l2.6,8h0.1l2.4-8c0.1-0.2,0.1-0.3,0.3-
0.3h2.6c0.1,0,0.3,0.1,0.2,0.3l-4,11.6c-0.1,0.1-0.1,0.3-0.3,0.3 L-976.3,788.8L-
976.3,788.8z"></path> <path id="XXMLID_44_" class="st10" d="M-
969.1,787.2c-0.1-0.1-0.1-0.3,0-0.3l1.6-1.5c0.1-0.1,0.3-
0.1,0.4,0c0.9,0.8,2.5,1.4,3.9,1.4 c1.6,0,2.4-0.6,2.4-1.4c0-0.7-0.5-1.2-2.2-1.3l-1.4-
0.1c-2.6-0.3-4-1.5-4-3.5c0-2.3,1.8-3.9,5-3.9c2,0,3.7,0.6,4.9,1.4
c0.1,0.1,0.1,0.3,0.1,0.3l-1.3,1.4c-0.1,0.1-0.3,0.1-0.4,0.1c-0.8-0.5-2.2-1-3.4-1c-
1.3,0-2,0.5-2,1.3c0,0.7,0.5,1.1,2.2,1.3 l1.4,0.1c2.7,0.3,4,1.6,4,3.5c0,2.4-1.9,4.1-
5.5,4.1C-966.1,789.2-968,788.2-969.1,787.2z"></path> <path
id="XXMLID_41_" class="st10" d="M-955.9,785.8c-0.3-0.8-0.5-1.7-0.5-3s0.1-
2.2,0.5-3c0.8-2.2,2.7-3.3,5.4-3.3
c2.7,0,4.6,1.3,5.4,3.3c0.3,0.8,0.5,1.7,0.5,3.7c0,0.1-0.1,0.3-0.3,0.3h-8.2c-0.1,0-
0.1,0.1-0.1,0.1c0,0.3,0.1,0.7,0.2,0.9 c0.5,1.2,1.4,1.8,2.9,1.8s2.4-0.5,3.1-1.1c0.1-
0.1,0.3-0.1,0.5-0.1l1.6,1.3c0.1,0.1,0.1,0.3,0.1,0.3c-1.1,1.2-3,2.1-5.4,2.1 C-
953.2,789.2-955.2,788-955.9,785.8z M-948,780.4c-0.3-1-1.3-1.6-2.5-1.6s-

2.2,0.6-2.6,1.6c-0.1,0.3-0.1,0.6-0.1,1 c0,0.1,0.1,0.1,0.1,0.1h5.2c0.1,0,0.1-0.1,0.1-0.1C-947.9,781.1-947.9,780.7-948,780.4z"></path> <path id="XXMLID_39_" class="st10" d="M-942.6,788.8c-0.1,0-0.3-0.1-0.3-0.3v-11.6c0-0.1,0.1-0.3,0.3-0.3h2.5c0.1,0,0.3,0.1,0.3,0.3 v1h0.1c0.6-0.9,1.8-1.6,3.4-1.6c1,0,2.1,0.4,2.7,1c0.1,0.1,0.1,0.3,0.1,0.3l-1.4,1.7c-0.1,0.1-0.3,0.1-0.4,0.1 c-0.6-0.3-1.2-0.6-2-0.6c-1.7,0-2.5,1.1-2.5,3.1v6.5c0,0.1-0.1,0.3-0.3,0.3L-942.6,788.8L-942.6,788.8z"></path> <path id="XXMLID_37_" class="st10" d="M-933.1,787c-0.1-0.1-0.1-0.3-0.1-0.4l1.7-1.8c0.1-0.1,0.3-0.1,0.4-0.1c1.2,0.9,3,1.8,5,1.8 c2.2,0,3.5-1,3.5-2.5c0-1.2-0.8-2-3.3-2.4l-1-0.1c-3.5-0.5-5.5-2-5.5-4.8c0-3.1,2.5-5.2,6.2-5.2c2.3,0,4.5,0.7,5.9,1.7 c0.1,0.1,0.1,0.2,0.1,0.3l-1.3,1.8c-0.1,0.1-0.3,0.1-0.4,0.1c-1.5-0.9-2.9-1.3-4.4-1.3c-1.9,0-2.9,0.9-2.9,2.3c0,1.2,0.9,2,3.4,2.3 l1,0.1c3.5,0.5,5.5,2,5.5,5s-2.4,5.3-6.9,5.3C-929.1,789.2-931.7,788.2-933.1,787z"></path> <path id="XXMLID_35_" class="st10" d="M-913.8,789.1c-2.6,0-3.7-1.2-3.7-3.5v-6.4c0-0.1-0.1-0.1-0.1-0.1h-0.8 c-0.1,0-0.3-0.1-0.3-0.3v-1.7c0-0.1,0.1-0.3,0.3-0.3h0.8c0.1,0,0.1-0.1,0.1-0.1v-3.3c0-0.1,0.1-0.3,0.3-0.3h2.5 c0.1,0,0.3,0.1,0.3,0.3v3.3c0,0.1,0.1,0.1,0.1,0.1h1.8c0.1,0,0.3,0.1,0.3,0.3v1.7c0,0.1-0.1,0.3-0.3,0.3h-1.8 c-0.1,0-0.1,0.1-0.1,0.1v6.3c0,0.8,0.4,1.1,1.2,1.1h0.7c0.1,0,0.3,0.1,0.3,0.3v2c0,0.1-0.1,0.3-0.3,0.3L-913.8,789.1L-913.8,789.1z "></path> <path id="XXMLID_32_" class="st10" d="M-902.3,788.8c-0.1,0-0.3-0.1-0.3-0.3v-0.9l0,0c-0.6,0.8-1.8,1.4-3.7,1.4 c-2.4,0-4.4-1.1-4.4-3.7c0-2.6,2-3.9,5.2-3.9h2.6c0.1,0,0.1-0.1,0.1-0.1v-0.6c0-1.4-0.7-2-2.9-2c-1.4,0-2.4,0.4-3,0.8 c-0.1,0.1-0.3,0.1-0.4-0.1l-1-1.6c-0.1-0.1-0.1-0.3,0.1-0.3c1-0.7,2.5-1.2,4.6-1.2c4,0,5.4,1.3,5.4,4.2v7.8c0,0.1-0.1,0.3-0.3,0.3 L-902.3,788.8L-902.3,788.8z M-902.6,784.8v-0.9c0-0.1-0.1-0.1-0.1-0.1h-2.2c-2,0-2.8,0.5-2.8,1.6c0,1,0.8,1.5,2.3,1.5 C-903.7,786.8-902.6,786.2-902.6,784.8z"></path> <path id="XXMLID_30_" class="st10" d="M-897.4,785.8c-0.3-0.8-0.5-1.7-0.5-3s0.1-2.2,0.5-3c0.8-2.2,2.8-3.3,5.4-3.3 c2,0,3.5,0.7,4.5,1.9c0.1,0.1,0.1,0.3-0.1,0.3l-1.7,1.4c-0.1,0.1-0.3,0.1-0.4-0.1c-0.7-0.7-1.3-1-2.4-1c-1.2,0-2.1,0.5-2.5,1.6 c-0.3,0.6-0.3,1.3-0.3,2.2s0.1,1.6,0.3,2.3c0.4,1,1.3,1.6,2.5,1.6c1.1,0,1.8-0.4,2.4-1c0.1-0.1,0.3-0.1,0.4-0.1l1.7,1.4 c0.1,0.1,0.1,0.3,0.1,0.3c-1,1.1-2.6,1.8-4.5,1.8C-894.6,789.2-896.6,788-897.4,785.8z"></path> <path id="XXMLID_28_" class="st10" d="M-876.9,788.8c-0.2,0-0.3-0.1-0.5-0.3l-3.3-5l-1.8,1.9v3.1c0,0.1-0.1,0.3-0.3,0.3h-2.5 c-0.1,0-0.3-0.1-0.3-0.3V772c0-0.1,0.1-0.3,0.3-0.3h2.5c0.1,0,0.3,0.1,0.3,0.3v9.8l4.5-4.8c0.1-0.2,0.3-0.3,0.5-0.3h2.8 c0.1,0,0.3,0.1,0.1,0.3l-4.2,4.4l4.7,7.2c0.1,0.1,0.1,0.3-0.1,0.3L-876.9,788.8L-876.9,788.8z"></path></g></svg> <h6>Social</h6> <ul class="horizontal-list footer-menu social-menu">   <svg version="1.1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" viewBox="0 0 19 17" style="enable-background:new 0 0 19 17;" xml:space="preserve"><style type="text/css"> .stwiiter{display:none;} .stwitter1{display:inline;fill:#FFFFFF;} .stwitter2{fill:#FFFFFF;}</style><g class="stwiiter"> <path class="stwitter1" d="M7.38,5.67H5.25V8.5h2.12V17h3.54V8.5h2.58l0.25-2.83h-2.83V4.49c0-0.68,0.14-0.94,0.79-0.94h2.04V0h-2.7 C8.51,0,7.38,1.12,7.38,3.27V5.67z"></path></g><g> <g id="Logo__x2014__FIXED"> <g> <path class="stwitter2" d="M5.97,16.22c7.17,0,11.09-5.95,11.09-11.09c0-0.17,0-0.33-0.01-0.5c0.76-

0.55,1.42-1.24,1.95-2.02 c-0.7,0.31-1.45,0.52-2.24,0.62c0.81-0.48,1.42-1.25,1.72-2.16C17.72,1.51,16.89,1.83,16,2.01c-0.71-0.76-1.73-1.23-2.84-1.23 c-2.15,0-3.9,1.75-3.9,3.9c0,0.3,0.04,0.6,0.1,0.89C6.11,5.41,3.24,3.85,1.32,1.49C0.98,2.07,0.79,2.74,0.79,3.45
C0.79,4.8,1.48,6,2.52,6.7C1.89,6.68,1.28,6.5,0.76,6.21c0,0.02,0,0.03,0,0.05c0,1.89,1.35,3.47,3.12,3.82 c-0.33,0.09-0.67,0.14-1.03,0.14c-0.25,0-0.49-0.02-0.73-0.07c0.49,1.55,1.94,2.68,3.64,2.71c-1.34,1.05-3.02,1.67-4.84,1.67 c-0.31,0-0.62-0.02-0.93-0.05C1.72,15.58,3.77,16.22,5.97,16.22"></path> </g> </g></g></svg>   <a class="social-link custom-btn-amp-events"
href="https://www.facebook.com/pages/BrowserStack/305988982776051"
target="_blank" rel="noopener noreferrer" title="Facebook" data-btn-eventname="ClickedOnFooter" data-btn-ampjson="{"value":"Facebook","group":"Social"}"> <svg version="1.1"
xmlns="http://www.w3.org/2000/svg"
xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" viewBox="0 0 19 17" style="enable-background:new 0 0 19 17;" xml:space="preserve"><style type="text/css"> .sfacebook{fill:#FFFFFF;}</style><path class="sfacebook"
d="M7.38,5.67H5.25V8.5h2.12V17h3.54V8.5h2.58l0.25-2.83h-2.83V4.49c0-0.68,0.14-0.94,0.79-0.94h2.04V0h-2.7
C8.51,0,7.38,1.12,7.38,3.27V5.67z"></path></svg>   <a class="social-link custom-btn-amp-events"
href="https://www.linkedin.com/company/browserstack/" target="_blank" rel="noopener noreferrer" title="LinkedIn" data-btn-eventname="ClickedOnFooter" data-btn-ampjson="{"value":"LinkedIn","group":"Social"}"> <svg version="1.1"
id="linkedInIconLayer_1" xmlns="http://www.w3.org/2000/svg"
xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" viewBox="0 0 459.5 450.7" xml:space="preserve" fill="#fff"><path d="M3.4,146.6l92.8-1.2v303.8l-92.8,1.2L3.4,146.6L3.4,146.6z"></path><path
d="M173.9,146.6l88.7-1.1v38.6l0,10.9c26.3-25.7,53.3-45.2,96.6-45.2c51,0,100.4,21.4,100.4,91v208.4l-90,1.3 V291.5c0-35.1-8.8-57.7-50.7-57.7c-36.9,0-52.4,6.6-52.4,55.2v160.4l-92.5,1.1L173.9,146.6L173.9,146.6z"></path><path d="M101.6,50.8c0,28.1-22.7,50.8-50.8,50.8S0,78.8,0,50.8C0,22.7,22.7,0,50.8,0C78.8,0,101.6,22.7,101.6,50.8 L101.6,50.8z"></path></svg>   <a class="social-link custom-btn-amp-events" href="https://www.youtube.com/c/browserstack"
target="_blank" rel="noopener noreferrer" title="YouTube" data-btn-eventname="ClickedOnFooter" data-btn-ampjson="{"value":"YouTube","group":"Social"}"> <svg enable-background="new 0 0 176 124" viewBox="0 0 176 124"
xmlns="http://www.w3.org/2000/svg"><path d="m172.3 19.4c-2-7.6-8-13.6-15.6-15.7-13.7-3.7-68.7-3.7-68.7-3.7s-55 0-68.8 3.7c-7.6 2-13.5 8-15.6 15.7-3.6 13.8-3.6 42.6-3.6 42.6s0 28.8 3.7 42.6c2 7.6 8 13.6 15.6 15.7 13.7 3.7 68.7 3.7 68.7 3.7s55 0 68.8-3.7c7.6-2 13.5-8 15.6-15.7 3.6-13.8 3.6-42.6 3.6-42.6s0-28.8-3.7-42.6zm-102.3 68.8v-52.4l46 26.2z" fill="#fff"></path></svg>   <a class="social-link custom-btn-amp-events"
href="https://www.instagram.com/browserstack" target="_blank" rel="noopener noreferrer" title="Instagram" data-btn-eventname="ClickedOnFooter" data-btn-ampjson="{"value":"Instagram","group":&quo

t;Social"}"> <svg xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink" width="18" height="18" viewBox="0 0 18 18"> <defs> <path id="prefix__a" d="M0 0.006L17.994 0.006 17.994 17.998 0 17.998z"></path> </defs> <g fill="none" fill-rule="evenodd"> <mask id="prefix__b" fill="#fff"> <use xlink:href="#prefix__a"></use> </mask> <path fill="#FFF" d="M8.997.006c-2.443 0-2.75.01-3.71.054-.957.043-1.611.196-2.183.418-.592.23-1.094.538-1.594 1.038S.702 2.518.472 3.109C.25 3.682.098 4.336.054 5.293.01 6.253 0 6.56 0 9.003c0 2.443.01 2.75.054 3.71.044.957.196 1.611.418 2.183.23.592.538 1.094 1.038 1.594s1.002.808 1.594 1.038c.572.222 1.226.374 2.184.418.96.044 1.266.054 3.71.054 2.443 0 2.749-.01 3.709-.054.957-.044 1.611-.196 2.184-.418.591-.23 1.093-.538 1.593-1.038s.808-1.002 1.038-1.594c.222-.572.375-1.226.418-2.184.044-.96.054-1.266.054-3.71 0-2.443-.01-2.749-.054-3.709-.044-.957-.196-1.611-.418-2.184-.23-.591-.538-1.093-1.038-1.593S15.482.708 14.891.478C14.318.256 13.664.104 12.707.06c-.96-.044-1.266-.054-3.71-.054zm0 1.62c2.402 0 2.687.01 3.636.053.877.04 1.353.187 1.67.31.42.163.72.358 1.035.673.315.315.51.615.673 1.035.123.317.27.793.31 1.67.043.949.052 1.234.052 3.636s-.009 2.687-.052 3.635c-.04.878-.187 1.354-.31 1.671-.163.42-.358.72-.673 1.035-.315.314-.615.51-1.035.673-.317.123-.793.27-1.67.31-.949.043-1.233.052-3.636.052-2.402 0-2.687-.01-3.635-.053-.878-.04-1.354-.186-1.671-.31-.42-.163-.72-.358-1.035-.672-.314-.315-.51-.615-.673-1.035-.123-.317-.27-.793-.31-1.67-.043-.95-.052-1.234-.052-3.636s.01-2.687.053-3.636c.04-.877.186-1.353.31-1.67.163-.42.358-.72.672-1.035.315-.315.615-.51 1.035-.673.317-.123.793-.27 1.67-.31.95-.043 1.234-.052 3.636-.052z" mask="url(#prefix__b)"></path> <path fill="#FFF" d="M8.997 12.002c-1.656 0-2.999-1.343-2.999-3 0-1.656 1.343-2.998 3-2.998 1.655 0 2.998 1.343 2.998 2.999 0 1.656-1.343 2.999-2.999 2.999zm0-7.62c-2.551 0-4.62 2.07-4.62 4.62 4.62 0 2.553 2.069 4.621 4.62 4.62 4.621 2.552 0 4.62-2.068 4.62-4.62s-2.068-4.62-4.62-4.62zM14.88 4.2c0 .596-.484 1.08-1.08 1.08-.596 0-1.08-.484-1.08-1.08 0-.596.484-1.08 1.08-1.08.596 0 1.08.484 1.08 1.08"></path> </g></svg>   <svg width="24" height="24" alt="Contact Us" viewBox="0 0 24 24" fill="none" xmlns="http://www.w3.org/2000/svg"><path d="M19 3H18V1H16V3H8V1H6V3H5C3.89 3 3 3.9 3 5V19C3 20.1 3.89 21 5 21H19C20.1 21 21 20.1 21 19V5C21 3.9 20.1 3 19 3ZM12 6C13.66 6 15 7.34 15 9C15 10.66 13.66 12 12 12C10.34 12 9 10.66 9 9C9 7.34 10.34 6 12 6ZM18 18H6V17C6 15 10 13.9 12 13.9C14 13.9 18 15 18 17V18Z" fill="white"></path></svg>Contact Us   <button class="footer-collapse-head" id="footer-mobile-menu-click">Do more with BrowserStack <svg xmlns="http://www.w3.org/2000/svg" viewBox="0 0 24 24" fill="#fff" width="14.5px" height="14.5px"><path d="M16.59 8.59L12 13.17 7.41 8.59 6 10l6 6 6-6z"></path><path d="M0 0h24v24H0z" fill="none"></path></svg> <svg xmlns="http://www.w3.org/2000/svg" viewBox="0 0 24 24"

fill="#fff" width="14.5px" height="14.5px"><path d="M12 8l-6 6 1.41 1.41L12 10.83l4.59 4.58L18 14z"></path><path d="M0 0h24v24H0z" fill="none"></path></svg></button> <ul id="menu-more-links" class="menu"><li id="menu-item-25044" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25044">Test In IE
<li id="menu-item-25045" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25045">Mobile Emulators
<li id="menu-item-25046" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25046">Test on iPhone
<li id="menu-item-25047" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25047">Test on iPad
<li id="menu-item-25048" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25048">Test on Galaxy
<li id="menu-item-25049" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25049">Android Testing
<li id="menu-item-25050" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25050">iOS Testing
<li id="menu-item-25051" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25051">Guide
<li id="menu-item-25052" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25052">Cross Browser Testing
<li id="menu-item-25053" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25053">Emulators & Simulators
<li id="menu-item-25054" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25054">Selenium
<li id="menu-item-27041" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-27041">Cypress
<li id="menu-item-25055" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25055">Android Emulators
<li id="menu-item-25056" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25056">Responsive Design
<li id="menu-item-29364" class="menu-item menu-item-type-custom menu-item-object-custom menu-item-29364">Visual Testing   <a class="brand custom-btn-amp-events" title="BrowserStack Logo" href="/" data-btn-eventname="ClickedOnFooter" data-btn-ampjson="{"value":"BrowserStack Logo"}"> <svg alt="Header logo" class="w-svg" width="219" version="1.1" id="Layer_1"

xmlns="http://www.w3.org/2000/svg"
xmlns:xlink="http://www.w3.org/1999/xlink" x="0px" y="0px" viewBox="-1076.1 758.6 202.1 43.6" style="enable-background:new -1076.1 758.6 202.1 43.6;" xml:space="preserve"><style type="text/css"> .st0{fill:#F4B960;} .st1{fill:#E66F32;} .st2{fill:#E43C41;} .st3{fill:#BDD041;} .st4{fill:#6DB54C;} .st5{fill:#AEDAE6;} .st6{fill:#56B8DE;} .st7{fill:#00B1D5;} .st8{fill:url(#XMLID_2_);} .st9{fill:#221F1F;} .st10{fill:#FFFFFF;}</style><g> <g id="XMLID_57_"> <circle id="XMLID_68_" class="st0" cx="-1054.3" cy="780.4" r="21.7"></circle> <circle id="XMLID_67_" class="st1" cx="-1056.5" cy="778.2" r="19.6"></circle> <circle id="XMLID_66_" class="st2" cx="-1053.8" cy="775.7" r="17"></circle> <circle id="XMLID_65_" class="st3" cx="-1052.5" cy="777" r="15.6"></circle> <circle id="XMLID_64_" class="st4" cx="-1053.6" cy="778.2" r="14.5"></circle> <circle id="XMLID_63_" class="st5" cx="-1055.9" cy="775.8" r="12.1"></circle> <circle id="XMLID_62_" class="st6" cx="-1054" cy="773.8" r="10.2"></circle> <circle id="XMLID_61_" class="st7" cx="-1052.7" cy="775.2" r="8.9"></circle> <radialGradient id="XMLID_2_" cx="-1053.988" cy="-164.5" r="7.661" gradientTransform="matrix(1 0 0 -1 0 611.9999)" gradientUnits="userSpaceOnUse"> <stop offset="0" style="stop-color:#797979"></stop> <stop offset="1" style="stop-color:#4C4C4C"></stop> </radialGradient> <circle id="XMLID_60_" class="st8" cx="-1054" cy="776.4" r="7.6"></circle> <circle id="XMLID_59_" class="st9" cx="-1054" cy="776.4" r="7.6"></circle> <ellipse id="XMLID_58_" transform="matrix(0.4094 -0.9124 0.9124 0.4094 -1326.5503 -501.9048)" class="st10" cx="-1050.9" cy="773.6" rx="2.4" ry="1.5"></ellipse> </g> <path id="XMLID_53_" class="st10" d="M-1025.5,772.2c0-0.1,0.1-0.3,0.3-0.3h6.9c3.9,0,5.7,1.8,5.7,4.5c0,2-1,3-2.2,3.6v0.1 c1.1,0.4,2.5,1.8,2.5,3.9c0,3.4-2.3,5-6.3,5h-6.6c-0.1,0-0.3-0.1-0.3-0.3C-1025.5,788.7-1025.5,772.2-1025.5,772.2z M-1018.4,779 c1.6,0,2.6-0.9,2.6-2.2c0-1.4-1-2.3-2.6-2.3h-3.7c-0.1,0-0.1,0.1-0.1,0.1v4.2c0,0.1,0.1,0.1,0.1,0.1 C-1022.2,779-1018.4,779-1018.4,779z M-1022.2,786.2h3.9c1.8,0,2.8-0.9,2.8-2.4s-1-2.4-2.8-2.4h-3.9c-0.1,0-0.1,0.1-0.1,0.1v4.4 C-1022.4,786.2-1022.2,786.2-1022.2,786.2z"></path> <path id="XMLID_51_" class="st10" d="M-1010.1,788.8c-0.1,0-0.3-0.1-0.3-0.3v-11.6c0-0.1,0.1-0.3,0.3-0.3h2.5 c0.1,0,0.3,0.1,0.3,0.3v1h0.1c0.6-0.9,1.8-1.6,3.4-1.6c1,0,2.1,0.4,2.7,1c0.1,0.1,0.1,0.3,0.1,0.3l-1.4,1.7 c-0.1,0.1-0.3,0.1-0.4,0.1c-0.6-0.3-1.2-0.6-2-0.6c-1.7,0-2.5,1.1-2.5,3.1v6.5c0,0.1-0.1,0.3-0.3,0.3L-1010.1,788.8L-1010.1,788.8z "></path> <path id="XMLID_48_" class="st10" d="M-1000.6,785.8c-0.3-0.8-0.5-1.6-0.5-3c0-1.4,0.1-2.2,0.5-3c0.8-2.2,2.7-3.3,5.4-3.3 c2.7,0,4.6,1.2,5.4,3.3c0.3,0.8,0.5,1.6,0.5,3c0,1.4-0.1,2.2-0.5,3c-0.8,2.2-2.7,3.3-5.4,3.3C-997.9,789.1-999.9,788-1000.6,785.8z M-992.7,785.1c0.3-0.6,0.3-1.2,0.3-2.2s-0.1-1.6-0.3-2.2c-0.4-1-1.2-1.6-2.5-1.6c-1.2,0-2.1,0.6-2.5,1.6c-0.3,0.7-0.3,1.2-0.3,2.2 s0.1,1.6,0.3,2.2c0.4,1,1.2,1.6,2.5,1.6C-994,786.7-993.2,786.1-992.7,785.1z"></path> <path id="XMLID_46_" class="st10" d="M-976.3,788.8c-0.1,0-0.3-0.1-0.3-0.3l-2.5-7.8h-0.1l-2.5,7.7c-0.1,0.1-0.1,0.3-0.3,0.3h-2.2 c-0.1,0-0.3-0.1-0.3-0.3l-4.1-11.6c-0.1-0.1,0.1-0.3,0.2-0.3h2.6c0.2,0,0.3,0.1,0.3,0.3l2.5,8h0.1l2.5-8c0.1-0.1,0.2-0.3,0.3-0.3h2 c0.1,0,0.3,0.1,0.3,0.3l2.6,8h0.1l2.4-8c0.1-0.2,0.1-0.3,0.3-0.3h2.6c0.1,0,0.3,0.1,0.2,0.3l-4,11.6c-0.1,0.1-0.1,0.3-0.3,0.3 L-976.3,788.8L-976.3,788.8z"></path> <path id="XMLID_44_" class="st10" d="M-969.1,787.2c-0.1-0.1-0.1-0.3,0-0.3l1.6-1.5c0.1-0.1,0.3-0.1,0.4,0c0.9,0.8,2.5,1.4,3.9,1.4 c1.6,0,2.4-0.6,2.4-1.4c0-0.7-0.5-1.2-2.2-1.3l-1.4-0.1c-2.6-0.3-4-1.5-4-3.5c0-2.3,1.8-3.9,5-3.9c2,0,3.7,0.6,4.9,1.4 c0.1,0.1,0.1,0.3,0.1,0.3l-1.3,1.4c-0.1,0.1-0.3,0.1-0.4,0.1c-0.8-0.5-2.2-1-3.4-1c-

1.3,0-2,0.5-2,1.3c0,0.7,0.5,1.1,2.2,1.3 l1.4,0.1c2.7,0.3,4,1.6,4,3.5c0,2.4-1.9,4.1-5.5,4.1C-966.1,789.2-968,788.2-969.1,787.2z"></path> <path id="XMLID_41_" class="st10" d="M-955.9,785.8c-0.3-0.8-0.5-1.7-0.5-3s0.1-2.2,0.5-3c0.8-2.2,2.7-3.3,5.4-3.3 c2.7,0,4.6,1.3,5.4,3.3c0.3,0.8,0.5,1.7,0.5,3.7c0,0.1-0.1,0.3-0.3,0.3h-8.2c-0.1,0-0.1,0.1-0.1,0.1c0,0.3,0.1,0.7,0.2,0.9 c0.5,1.2,1.4,1.8,2.9,1.8s2.4-0.5,3.1-1.1c0.1-0.1,0.3-0.1,0.5-0.1l1.6,1.3c0.1,0.1,0.1,0.3,0.1,0.3c-1.1,1.2-3,2.1-5.4,2.1 C-953.2,789.2-955.2,788-955.9,785.8z M-948,780.4c-0.3-1-1.3-1.6-2.5-1.6s-2.2,0.6-2.6,1.6c-0.1,0.3-0.1,0.6-0.1,1 c0,0.1,0.1,0.1,0.1,0.1h5.2c0.1,0,0.1-0.1,0.1-0.1C-947.9,781.1-947.9,780.7-948,780.4z"></path> <path id="XMLID_39_" class="st10" d="M-942.6,788.8c-0.1,0-0.3-0.1-0.3-0.3v-11.6c0-0.1,0.1-0.3,0.3-0.3h2.5c0.1,0,0.3,0.1,0.3,0.3 v1h0.1c0.6-0.9,1.8-1.6,3.4-1.6c1,0,2.1,0.4,2.7,1c0.1,0.1,0.1,0.3,0.1,0.3l-1.4,1.7c-0.1,0.1-0.3,0.1-0.4,0.1 c-0.6-0.3-1.2-0.6-2-0.6c-1.7,0-2.5,1.1-2.5,3.1v6.5c0,0.1-0.1,0.3-0.3,0.3L-942.6,788.8L-942.6,788.8z"></path> <path id="XMLID_37_" class="st10" d="M-933.1,787c-0.1-0.1-0.1-0.3-0.1-0.4l1.7-1.8c0.1-0.1,0.3-0.1,0.4-0.1c1.2,0.9,3,1.8,5,1.8 c2.2,0,3.5-1,3.5-2.5c0-1.2-0.8-2-3.3-2.4l-1-0.1c-3.5-0.5-5.5-2-5.5-4.8c0-3.1,2.5-5.2,6.2-5.2c2.3,0,4.5,0.7,5.9,1.7 c0.1,0.1,0.1,0.2,0.1,0.3l-1.3,1.8c-0.1,0.1-0.3,0.1-0.4,0.1c-1.5-0.9-2.9-1.3-4.4-1.3c-1.9,0-2.9,0.9-2.9,2.3c0,1.2,0.9,2,3.4,2.3 l1,0.1c3.5,0.5,5.5,2,5.5,5s-2.4,5.3-6.9,5.3C-929.1,789.2-931.7,788.2-933.1,787z"></path> <path id="XMLID_35_" class="st10" d="M-913.8,789.1c-2.6,0-3.7-1.2-3.7-3.5v-6.4c0-0.1-0.1-0.1-0.1-0.1h-0.8 c-0.1,0-0.3-0.1-0.3-0.3v-1.7c0-0.1,0.1-0.3,0.3-0.3h0.8c0.1,0,0.1-0.1,0.1-0.1v-3.3c0-0.1,0.1-0.3,0.3-0.3h2.5 c0.1,0,0.3,0.1,0.3,0.3v3.3c0,0.1,0.1,0.1,0.1,0.1h1.8c0.1,0,0.3,0.1,0.3,0.3v1.7c0,0.1-0.1,0.3-0.3,0.3h-1.8 c-0.1,0-0.1,0.1-0.1,0.1v6.3c0,0.8,0.4,1.1,1.2,1.1h0.7c0.1,0,0.3,0.1,0.3,0.3v2c0,0.1-0.1,0.3-0.3,0.3L-913.8,789.1L-913.8,789.1z "></path> <path id="XMLID_32_" class="st10" d="M-902.3,788.8c-0.1,0-0.3-0.1-0.3-0.3v-0.9l0,0c-0.6,0.8-1.8,1.4-3.7,1.4 c-2.4,0-4.4-1.1-4.4-3.7c0-2.6,2-3.9,5.2-3.9h2.6c0.1,0,0.1-0.1,0.1-0.1v-0.6c0-1.4-0.7-2-2.9-2c-1.4,0-2.4,0.4-3,0.8 c-0.1,0.1-0.3,0.1-0.4-0.1l-1-1.6c-0.1-0.1-0.1-0.3,0.1-0.3c1-0.7,2.5-1.2,4.6-1.2c4,0,5.4,1.3,5.4,4.2v7.8c0,0.1-0.1,0.3-0.3,0.3 L-902.3,788.8L-902.3,788.8z M-902.6,784.8v-0.9c0-0.1-0.1-0.1-0.1-0.1-0.1h-2.2c-2,0-2.8,0.5-2.8,1.6c0,1,0.8,1.5,2.3,1.5 C-903.7,786.8-902.6,786.2-902.6,784.8z"></path> <path id="XMLID_30_" class="st10" d="M-897.4,785.8c-0.3-0.8-0.5-1.7-0.5-3s0.1-2.2,0.5-3c0.8-2.2,2.8-3.3,5.4-3.3 c2,0,3.5,0.7,4.5,1.9c0.1,0.1,0.1,0.3-0.1,0.3l-1.7,1.4c-0.1,0.1-0.3,0.1-0.4-0.1c-0.7-0.7-1.3-1-2.4-1c-1.2,0-2.1,0.5-2.5,1.6 c-0.3,0.6-0.3,1.3-0.3,2.2s0.1,1.6,0.3,2.3c0.4,1,1.3,1.6,2.5,1.6c1.1,0,1.8-0.4,2.4-1c0.1-0.1,0.3-0.1,0.4-0.1l1.7,1.4 c0.1,0.1,0.1,0.3,0.1,0.3c-1,1.1-2.6,1.8-4.5,1.8C-894.6,789.2-896.6,788-897.4,785.8z"></path> <path id="XMLID_28_" class="st10" d="M-876.9,788.8c-0.2,0-0.3-0.1-0.5-0.3l-3.3-5l-1.8,1.9v3.1c0,0.1-0.1,0.3-0.3,0.3h-2.5 c-0.1,0-0.3-0.1-0.3-0.3V772c0-0.1,0.1-0.3,0.3-0.3h2.5c0.1,0,0.3,0.1,0.3,0.3v9.8l4.5-4.8c0.1-0.2,0.3-0.3,0.5-0.3h2.8 c0.1,0,0.3,0.1,0.1,0.3l-4.2,4.4l4.7,7.2c0.1,0.1,0.1,0.3-0.1,0.3L-876.9,788.8L-876.9,788.8z"></path></g></svg>   <button class="footer-collapse-head" id="footer-menu-click">Do more with BrowserStack <svg xmlns="http://www.w3.org/2000/svg" viewBox="0 0 24 24" fill="#fff" width="14.5px" height="14.5px"><path d="M16.59 8.59L12 13.17 7.41 8.59 6 10l6 6 6-6z"></path><path d="M0 0h24v24H0z" fill="none"></path></svg> <svg xmlns="http://www.w3.org/2000/svg" viewBox="0 0 24 24" fill="#fff" width="14.5px" height="14.5px"><path d="M12 8l-6 6 1.41 1.41L12

10.83l4.59 4.58L18 14z"></path><path d="M0 0h24v24H0z" fill="none"></path></svg></button> <ul id="menu-more-links-1" class="menu"><li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25044">Test In IE
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25045">Mobile Emulators
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25046">Test on iPhone
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25047">Test on iPad
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25048">Test on Galaxy
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25049">Android Testing
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25050">iOS Testing
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25051">Guide
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25052">Cross Browser Testing
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25053">Emulators & Simulators
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25054">Selenium
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-27041">Cypress
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25055">Android Emulators
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-25056">Responsive Design
<li class="menu-item menu-item-type-custom menu-item-object-custom menu-item-29364">Visual Testing   © 2011-2022 BrowserStack - The Most Reliable Mobile App & Cross Browser Testing Company   <ul class="horizontal-list legal"> <li class="legal-list"> Terms of Service <li class="legal-list"> <a class="custom-btn-amp-events" href="/privacy" data-btn-eventname="ClickedOnFooter" data-btn-

ampjson="{"value":"Privacy Policy"}">Privacy Policy <li class="legal-list"> Cookie Policy <li class="legal-list"> Sitemap   </footer>   We use cookies to enhance user experience. By continuing to browse or closing this banner, you agree to our Privacy Policy & Terms of Service.   <button class="btn btn-primary cookie-notification__got-it-cta js__accept-cookie" id="accept-cookie-notification" aria-label="Accept all the policies and terms"> Accept All </button> <button class="cookie-notification__close js__accept-cookie" id="accept-cookie-notification-cross" aria-label="Accept all the policies and terms and close the policies and terms of service acceptance banner"> <svg width="10px" height="10px" viewBox="0 0 10 10" version="1.1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink"> <g> <path d="M6.43835616,5.15981735 C6.34703196,5.06849315 6.34703196,4.93150685 6.43835616,4.84018265 L9.8630137,1.41552511 C9.9543379,1.32420091 10,1.18721461 10,1.09589041 C10,1.00456621 9.9543379,0.867579909 9.8630137,0.776255708 L9.22374429,0.136986301 C9.13242009,0.0456621005 8.99543379,0 8.90410959,0 C8.76712329,0 8.67579909,0.0456621005 8.58447489,0.136986301 L5.15981735,3.56164384 C5.06849315,3.65296804 4.93150685,3.65296804 4.84018265,3.56164384 L1.41552511,0.136986301 C1.32420091,0.0456621005 1.18721461,0 1.09589041,0 C1.00456621,0 0.867579909,0.0456621005 0.776255708,0.136986301 L0.136986301,0.776255708 C0.0456621005,0.867579909 0,1.00456621 0,1.09589041 C0,1.18721461 0.0456621005,1.32420091 0.136986301,1.41552511 L3.56164384,4.84018265 C3.65296804,4.93150685 3.65296804,5.06849315 3.56164384,5.15981735 L0.136986301,8.58447489 C0.0456621005,8.67579909 0,8.81278539 0,8.90410959 C0,8.99543379 0.0456621005,9.13242009 0.136986301,9.22374429 L0.776255708,9.8630137 C0.867579909,9.9543379 1.00456621,10 1.09589041,10 C1.18721461,10 1.32420091,9.9543379 1.41552511,9.8630137 L4.84018265,6.43835616 C4.93150685,6.34703196 5.06849315,6.34703196 5.15981735,6.43835616 L8.58447489,9.8630137 C8.67579909,9.9543379 8.81278539,10 8.90410959,10 C8.99543379,10 9.13242009,9.9543379 9.22374429,9.8630137 L9.8630137,9.22374429 C9.9543379,9.13242009 10,8.99543379 10,8.90410959 C10,8.81278539 9.9543379,8.67579909 9.8630137,8.58447489 L6.43835616,5.15981735 L6.43835616,5.15981735 Z" fill="#fff"></path> </g> </svg> </button>   <svg width="10px" height="10px" viewBox="0 0 10 10" fill="#aeaeae" version="1.1" xmlns="http://www.w3.org/2000/svg" xmlns:xlink="http://www.w3.org/1999/xlink"> <g> <path

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6.34703196,4.93150685 6.43835616,4.84018265 L9.8630137,1.41552511
C9.9543379,1.32420091 10,1.18721461 10,1.09589041 C10,1.00456621
9.9543379,0.867579909 9.8630137,0.776255708 L9.22374429,0.136986301
C9.13242009,0.0456621005 8.99543379,0 8.90410959,0 C8.76712329,0
8.67579909,0.0456621005 8.58447489,0.136986301 L5.15981735,3.56164384
C5.06849315,3.65296804 4.93150685,3.65296804 4.84018265,3.56164384
L1.41552511,0.136986301 C1.32420091,0.0456621005 1.18721461,0
1.09589041,0 C1.00456621,0 0.867579909,0.0456621005
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C0.0456621005,0.867579909 0,1.00456621 0,1.09589041 C0,1.18721461
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C3.65296804,4.93150685 3.65296804,5.06849315 3.56164384,5.15981735
L0.136986301,8.58447489 C0.0456621005,8.67579909 0,8.81278539
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1.00456621,10 1.09589041,10 C1.18721461,10 1.32420091,9.9543379
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5.06849315,6.34703196 5.15981735,6.43835616 L8.58447489,9.8630137
C8.67579909,9.9543379 8.81278539,10 8.90410959,10 C8.99543379,10
9.13242009,9.9543379 9.22374429,9.8630137 L9.8630137,9.22374429
C9.9543379,9.13242009 10,8.99543379 10,8.90410959 C10,8.81278539
9.9543379,8.67579909 9.8630137,8.58447489 L6.43835616,5.15981735
L6.43835616,5.15981735 Z"></path> </g> </svg> <p
class="freshchat-bubble--text" id="freshchat-bubble--text"></p>
<button id="custom-fc-frame" class="hide custom-chat-wrapper"> <img
class="b-lazy b-lazy-hidden" id="chat-icon" width="20" height="20"
src="
cmcvMjAwMC9zdmcnIHZpZXdCb3g9JzAgMCAzIDInPjwvc3ZnPg==" data-lazy-
type="image" data-id="29962"
data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-
content/uploads/2021/03/chat-icon.svg" alt="" title="chat-
icon"><noscript><img id="chat-icon" width="20" height="20"
src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/
uploads/2021/03/chat-icon.svg" alt="" title="chat-icon" ></noscript> Talk to
an Expert </button> <div class="bs-modal-
body">   <div class="pop-up-
signup__container-form"> <div class="text-center learnupon-form-container
popup-signup-form pack-signup-form col-center"> <form accept-charset="UTF-
8" action="/users" autocomplete="on" class="pack-signup-form__form"
id="popup_signin_signup_form" method="post" name="signin_signup_form">
  <div
class="popup_signupFormHeader" id="popup_signupFormHeader"> <h3
id="popUpCsfModalTitle" class="popup-heading-text">Create a FREE
account</h3> <p id="popUpCsfModalDesc" class="popup-sub-heading-
text">No credit card required!</p> <a class="btn btn-secondary-gray
col-center oauth-btn google-logo-btn pack-signup-form__g-btn"
id="popup_google-sign-on-btn" data-oauth-type="google"
href="/users/auth/google_oauth2?state=" rel="nofollow"><img alt="Google
Logo" class="b-lazy b-lazy-hidden pack-signup-form__g-btn-img"
src="
cmcvMjAwMC9zdmcnIHZpZXdCb3g9JzAgMCAzIDInPjwvc3ZnPg==" data-lazy-
type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-
wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/misc/g-

logo.svg"><noscript><img alt="Google Logo" class="pack-signup-form__g-btn-img" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/misc/g-logo.svg"></noscript>Sign up with Google   or   <input autocomplete="on" aria-label="Enter Full Name" class="custom-input-field input-lg text" id="popup_user_full_name" name="user[full_name]" placeholder="Full name" type="text" aria-required="true">   <input autocomplete="on" aria-label="Enter Business Email" class="custom-input-field input-lg text user_email_ajax" id="popup_user_email_login" name="user[email]" placeholder="Business Email" type="text" aria-required="true">   <input autocomplete="on" aria-label="Enter Password" class="custom-input-field input-lg text" id="popup_user_password" name="user[password]" placeholder="Password" type="password" aria-required="true">   Login   <input class="bs-checkbox signup-checkbox" id="popup_tnc_checkbox" name="terms_and_conditions" type="checkbox" value="1" aria-labelledby="auth_tnc_wrapper" aria-required="true"> <img alt="Checkmark" class="b-lazy b-lazy-hidden checkbox--mark" src="" data-lazy-type="image" data-id="0" data-lazy-src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/misc/checkmark.svg" width="10" height="10"><noscript><img alt="Checkmark" class="checkbox--mark" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/img/misc/checkmark.svg" width="10" height="10"></noscript> <label class="signup-checkbox-label" for="popup_tnc_checkbox">I agree to BrowserStack's Terms of Service and Privacy Policy.</label>   <input class="btn btn-primary col-center main-submit-btn" data-disable-with="Signing in..." id="popup_user_submit" name="commit" type="submit" value="Sign me up" role="button"> <input id="popup_utf_no" name="utf8" type="hidden" value="✓"> <input name="authenticity_token" type="hidden"> <div class="g-recaptcha show"

data-badge="bottomleft" data-size="invisible" data-callback="popUpRecaptchaCallback" data-expired-callback="popUpExpiredCaptchaCallback" data-theme="light" data-sitekey="6LfPB0gfAAAAAEGuLN9MjeW_FoAneVBD6R76b-uZ">   Already have an account? Sign in   </form>   <h4>What’s Included?</h4> Live - 30 mins of interactive browser testing AppLive - 30 mins of interactive app testing Automate - 100 mins of automated browser testing AppAutomate - 100 mins of automated app testing Percy - 50,000 screenshots/month for visual testing Instant access to 1000+ real devices Testing on internal development environments Jira, Trello, GitHub and Slack integration   Healthcare company GoodRx used BrowserStack to reduce Testing Time by 90% to Release 15 Times a Day   Optimizely runs 15000+ tests every 45 minutes with the help of BrowserStack   Carousell used BrowserStack to reduce manual regression time by 7x   <button class="pop-up-signup-testi-slider-nav-btn" disabled="disabled" data-action="slideLeft" aria-label="Previous"><svg width="8" height="14" viewBox="0 0 8 14" fill="none" xmlns="http://www.w3.org/2000/svg"><path d="M7.88986 1.58002L6.7032 0.400024L0.109863 7.00002L6.70986 13.6L7.88986 12.42L2.46986 7.00002L7.88986 1.58002Z" class="pop-up-signup-testi-slider-nav-btn-path" fill="white"></path></svg> </button>   <button class="pop-up-signup-testi-slider-nav-btn" disabled="disabled" data-action="slideRight" aria-label="Next"><svg width="8" height="14" viewBox="0 0 8 14" fill="none" xmlns="http://www.w3.org/2000/svg"><path d="M0.0766602 12.4867L1.25666 13.6667L7.92333 7.00004L1.25666 0.333374L0.0766602 1.51337L5.56333 7.00004L0.0766602 12.4867Z" class="pop-up-signup-testi-slider-nav-btn-path" fill="white"></path></svg> </button>   <script type="text/javascript">
window.addEventListener("load", function() {
var script = document.createElement('script');
script.src = 'https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/themes/browserstack/js/dist/bstack-load-scripts.js?v=1659000872';
document.getElementsByTagName('head')[0].appendChild(script);
});
</script> <script type="text/javascript" id="main-js-extra">
/* <![CDATA[*/

var ajax_initialize_script = {"ajaxurl":"https:\/\/browserstack.wpengine.com\/wp-admin\/admin-ajax.php","ajax_nonce":"00ff635ca9"};
/*]]> */
</script><script defer="defer" src="https://3fxtqy18kygf3on3bu39kh93-wpengine.netdna-ssl.com/wp-content/cache/js/bstack_8ac3d622ded572b06f3bdb6107c8275f.js?v=1659099142" integrity="sha384-u0qYHrIykRTCtR5vsM0NxiPgz4m5u/K/zAiDaGaXEf5xxqVNbR2uuB82Phc/Ut8y" crossorigin="anonymous"></script><img src="https://server.recotap.com/api/rtp/?uuid=hkPiuSyvonnsDXGzvaLF4N5nZ" style="display: none;"><img src="https://t.co/i/adsct?bci=3&eci=2&event_id=05387320-ef06-4edc-b55e-7d61e324dca9&events=%5B%5B%22pageview%22%2C%7B%7D%5D%5D&p_id=Twitter&p_user_id=0&pl_id=d2eb2ab5-94ce-403e-bd0e-d6b1b6bd0af7&tw_document_href=https%3A%2F%2Fwww.browserstack.com%2Fguide%2Fhow-to-inspect-element-on-iphone&tw_iframe_status=0&tw_order_quantity=0&tw_sale_amount=0&txn_id=o2jt9&type=javascript&version=2.4.15" height="1" width="1" style="display: none;"><img src="https://analytics.twitter.com/i/adsct?bci=3&eci=2&event_id=05387320-ef06-4edc-b55e-7d61e324dca9&events=%5B%5B%22pageview%22%2C%7B%7D%5D%5D&p_id=Twitter&p_user_id=0&pl_id=d2eb2ab5-94ce-403e-bd0e-d6b1b6bd0af7&tw_document_href=https%3A%2F%2Fwww.browserstack.com%2Fguide%2Fhow-to-inspect-element-on-iphone&tw_iframe_status=0&tw_order_quantity=0&tw_sale_amount=0&txn_id=o2jt9&type=javascript&version=2.4.15" height="1" width="1" style="display: none;"></body></html>

<html lang="en-GB"><!--<![endif]--><head>
   <meta http-equiv="X-UA-Compatible" content="IE=edge">
   <meta http-equiv="Content-Type" content="text/html; charset=UTF-8">
   <meta name="msapplication-config" content="none">
   <meta name="robots" content="noindex">
   <meta id="qa-page-time" name="appTimeStamp" content="">
   <title>
     Sign in to your Universal Credit account - Universal Credit
</title>

   <link href="/styles/print.b3968944d81d470d83d2.css" media="print" rel="stylesheet">
   <link rel="shortcut icon" href="/images/govuk/favicon.b5bada83242a9ba0445b.ico" type="image/x-icon">
   <link class="svg-icon" rel="mask-icon" href="/images/govuk/govuk_logotype_crown.f0c3832c79a5d6880040.svg">

   <!-- Size for iPad and iPad mini (high resolution) -->
   <link rel="apple-touch-icon-precomposed" sizes="152x152" href="/images/govuk/govuk-apple-touch-icon-152x152.a030b91c0e1aec4960e0.png">

   <!-- Size for iPhone and iPod touch (high resolution) -->
   <link rel="apple-touch-icon-precomposed" sizes="120x120" href="/images/govuk/apple-touch-icon-120x120.8c3cf787aaa88e245d4b.png">

```
    <!-- Size for iPad 2 and iPad mini (standard resolution) -->
    <link rel="apple-touch-icon-precomposed" sizes="76x76"
href="/images/govuk/apple-touch-icon-76x76.7c0a307fb22cb1055a0d.png">

    <!-- Default non-defined size, also used for Android 2.1+ devices -->
    <link rel="apple-touch-icon-precomposed" href="/images/govuk/govuk-apple-
touch-icon.7e22b25bbeaf44c5e183.png">

    <meta name="viewport" content="width=device-width, initial-scale=1">
    <meta content="True" name="HandheldFriendly">
    <meta content="320" name="MobileOptimized">
    <meta id="page-id" name="pageId"
content="Qr7nPlS8PVmAjhh4gLp5fs8ZrAc6zGgjBVjOaX+C0sgVdhFqpGzKNu8yfd
8rAfAvKYkc6whqalqcdy8ETj7ybg==">



    <meta property="og:image" content="/images/govuk/govuk-opengraph-
image.b0487e2f69fadb376f8d.png">

        <link href="/styles/styles-govuk.02c1e0f5c755799daa22.css"
rel="stylesheet" type="text/css">
<link href="/styles/styles-common.05b79b0d9cca8c220a8d.css"
rel="stylesheet" type="text/css">



      <noscript>
        &lt;meta http-equiv="refresh" content="910"&gt;
      </noscript>


    <meta name="google-tagmanager-id" id="ga-tag-manager-id"
content="GTM-TP685K">


  <script type="text/javascript" async="" src="https://www.google-
analytics.com/analytics.js" nonce=""></script><script async=""
src="//www.googletagmanager.com/gtm.js?id=GTM-TP685K"></script><script
nonce="">
    window.dataLayer = window.dataLayer || [];
    window.dataLayer.push({
        'gtm.whitelist':
['gaawc','gaawe','ua','cl','lcl','fsl','tl','jel','hl','v','c','ctv','e','dbg','d','f','j','smm','r','u'
,'evl','vis','gas','remm']
    });

    var gaTagManagerPropertyIdElem = document.getElementById('ga-tag-
manager-id'),
        gaTagManagerPropertyId =
gaTagManagerPropertyIdElem.getAttribute('content').trim();
```

```
    if (document.cookie.indexOf('uc_cookies_policy=accepted') !== -1 && /[?
&]ga=0/.test(window.location.search) === false) {

      (function (w,d,s,l,i) {
        w[l] = w[l] || [];
        w[l].push({
          'gtm.start': new Date().getTime(),
          event: 'gtm.js'
        });

        var f = d.getElementsByTagName(s)[0],
            j = d.createElement(s),
            dl = l != 'dataLayer' ? '&l=' + l:'';

        j.async = true;
        j.src = '//www.googletagmanager.com/gtm.js?id=' + i + dl;

        f.parentNode.insertBefore(j,f);
      })(window, document, 'script', 'dataLayer', gaTagManagerPropertyId);
    }
  </script>


  </head>

  <body class="claimant  js-enabled" id="body">
    <script>document.body.className = ((document.body.className) ?
document.body.className + " js-enabled" : "js-enabled");</script>
          <noscript>&lt;iframe class="hidden"
src="//www.googletagmanager.com/ns.html?id=GTM-TP685K" height="0"
width="0"&gt;&lt;/iframe&gt;</noscript>



      <header>
    <div id="id-cookie-banner" class="govuk-cookie-banner hidden"
role="region" aria-labelledby="id-cookie-banner-heading">
    <div class="govuk-cookie-banner__message govuk-cookie-banner__message--
initial govuk-width-container gutter-half-bottom">
      <div class="govuk-grid-row">
        <div class="govuk-grid-column-two-thirds">
          <h2 id="id-cookie-banner-heading" class="govuk-cookie-
banner__heading">Cookies on Universal Credit</h2>

          <div class="govuk-cookie-banner__content">
            <p>We use some essential cookies to make this service work.</p>
            <p>We'd also like to use analytics cookies so we can understand how
you use the service and make improvements.</p>
          </div>
        </div>
      </div>

      <div class="gutter-quarter-bottom">
```

```
        <button type="button" class="button govuk-cookie-banner__accept-
button">Accept analytics cookies</button>
        <button type="button" class="button govuk-cookie-banner__reject-
button">Reject analytics cookies</button>
      </div>
      <a id="cookie-policy-info-link" class="govuk-link" href="/cookiepolicy?
ga=0">View cookies</a>
    </div>

    <div class="govuk-cookie-banner__message govuk-cookie-banner__message--
accepted govuk-width-container hidden" role="alert">
      <div class="govuk-grid-row">
        <div class="govuk-grid-column-two-thirds">
          <div class="govuk-cookie-banner__content">
            <p>You've accepted analytics cookies. You can <a class="govuk-link"
href="/cookiepolicy">change your cookie settings</a> at any time.</p>
          </div>
        </div>
      </div>

      <button class="button govuk-cookie-banner__hide-button gutter-
bottom">Hide this messsage</button>
    </div>

    <div class="govuk-cookie-banner__message govuk-cookie-banner__message--
rejected govuk-width-container hidden" role="alert">
      <div class="govuk-grid-row">
        <div class="govuk-grid-column-two-thirds">
          <div class="govuk-cookie-banner__content">
            <p>You've rejected analytics cookies. You can <a class="govuk-link"
href="/cookiepolicy">change your cookie settings</a> at any time.</p>
          </div>
        </div>
      </div>

      <button class="button govuk-cookie-banner__hide-button gutter-
bottom">Hide this messsage</button>
    </div>
  </div>

  <script nonce="">
    (function () {
      if (document.cookie.indexOf('uc_cookies_policy') === -1) {
        document.querySelector('.govuk-cookie-banner').classList.remove('hidden');
      }
    })();
  </script>

<a href="#content" class="skiplink">Skip to main content</a>

  <div id="global-header" class="with-proposition">
    <div class="header-wrapper">
      <div class="header-global">
      <div class="header-logo">
```

```
        <a href="https://www.gov.uk/" title="Go to the GOV.UK homepage"
id="logo" class="content">
          <img
src="/images/govuk/govuk_logo_crown_print.1f27d633e8ee5dd6b2dc.png"
width="35" height="31" alt="">
          GOV.UK
        </a>
      </div>

      </div>

        <div class="header-proposition">
      <nav id="proposition-menu" class="content" aria-label="Site">
        <a href="/" id="proposition-name">Universal Credit</a>
      </nav>
    </div>

    </div>
  </div>
  <div id="global-header-bar"></div>

    <div class="inner-block print-hide">
  <div class="phase-banner">
    <p class="inline">
      <strong class="phase-tag">
        BETA

      </strong>
      <span>
        This is a new service - your feedback will help us to improve it.

      </span>
    </p>
  </div>
</div>

</header>
    <!--end header-->

        <main id="wrapper">

      <div id="content" class="">









  <div class="inner-block">
```

```
<h1 class="heading-xlarge " data-sanitized-page-title="Sign in to your Universal
Credit account" data-tag-page-title="Sign in to your Universal Credit account">
    <span id="id-subtitle" class="category heading-secondary">

    </span>
  <span class="js-page-title" id="main-heading">
      Sign in to your Universal Credit account
  </span>
    <span class="category heading-secondary">

    </span>
</h1>




<div class="important-information">
          <p id="timed-out">We've signed you out to protect your personal
information. Sign in to continue.</p>

</div>
  <p>You will have created an account when you made your claim.</p>

<form method="post" novalidate="" autocomplete="off" action="/sign-in">

  <input type="hidden" name="csrfToken" value="">



<div id="id-section-userName" class="form-group  border-box gutter-sixth-
bottom">
  <label class="form-label-bold text " for="id-userName">
    Username
  </label>

    <div id="id-section-help-userName" class="form-hint text ">

    </div>
  <div id="id-section-error-userName" data-validation-error="" class="form-error
validation-message ">

  </div>


  <input class="form-control left" type="text" id="id-userName"
name="userName" value="" aria-describedby="id-section-help-userName id-
section-error-userName ">
</div>
        <a id="forgot-username" href="/account/forgot-username?
linkName=oldLink">Forgotten username</a>
```

```
<div id="id-section-password" class="form-group  border-box gutter-top gutter-
sixth-bottom">
  <label class="form-label-bold" for="id-password">
    Password
  </label>
  <div id="id-section-help-password" class="form-hint text ">

  </div>
    <div id="id-section-error-password" data-validation-error="" class="form-
error validation-message ">

    </div>
  <input class="form-control " type="password" id="id-password"
name="password" value="" aria-describedby="id-section-help-password id-
section-error-password ">
</div>
        <a id="login-password-reset" href="/sign-in/password-reset?
linkName=oldLink">Forgotten password</a>

<div class="buttonSpacing">
  <div class="gutter-top gutter-bottom">

    <input formnovalidate="" data-tag-submit-button="" id="id-submit-button"
class="button" type="submit" name="next" value="Sign in" data-reset-local-
storage="">



  </div>
</div>


</form>
       <div id="qa-register-panel" class="form-group">
         <h2 class="heading-medium">If you have never claimed Universal
Credit</h2>
         <p>You may be able to use the <a href="/start">Universal Credit online
service</a> to:</p>
         <ul class="list-bullet">
           <li>create a Universal Credit account</li>
           <li>make a claim</li>
           <li>join your partner's claim</li>
         </ul>
       </div>

     <h2 class="heading-medium">If you used GOV.UK Verify to confirm your
identity</h2>
       <p>You can no longer sign in to your account with GOV.UK Verify.</p>
       <p>You will need to use the username and password you created when you
set up your Universal Credit account.</p>
       <p>If you have forgotten your sign in details we can send a reminder to
your registered email address. <a id="contact-us" href="/contact">Contact
us</a> if you do not have access to this address.</p>
  </div>
```

```
        <div class="inner-block clear js-visible cf">

        </div>
      </div>
    </main>


    <footer class="group js-footer" id="footer">

      <div class="footer-wrapper">


        <div class="footer-meta">
          <div class="footer-meta-inner">
              <ul>
      <li><a id="contact-link" href="/contact">Contact</a></li>
      <li><a href="/privacypolicy">Privacy</a></li>
      <li><a id="cookie-policy-link" href="/cookiepolicy">Cookies</a></li>
        <li><a id="accessibility-statement-link" href="/accessibility-
statement">Accessibility</a></li>
    </ul>


            <div class="open-government-licence">
              <div class="logo"><a
href="https://www.nationalarchives.gov.uk/doc/open-government-licence/
version/3/" rel="license">Open Government Licence</a></div>
              <p>All content is available under the <a
href="https://www.nationalarchives.gov.uk/doc/open-government-licence/
version/3/" rel="license">Open Government Licence v3.0</a>, except where
otherwise stated</p>
            </div>
          </div>

          <div class="copyright">
            <a href="https://www.nationalarchives.gov.uk/information-
management/re-using-public-sector-information/uk-government-licensing-
framework/crown-copyright/">© Crown copyright</a>
          </div>
        </div>
      </div>
    </footer>

    <div id="global-app-error" class="app-error hidden"></div>



    <div id="accessibility-status" class="accessibility-status visuallyhidden"
role="status" aria-live="polite" aria-atomic="true"></div>
```

  <script src="/scripts/vendor.19cbfea38844b01d03e1.js"></script>
<script src="/scripts/claimant.def6069b5a0c522fde14.js"></script>

</body></html>

<html xmlns="https://www.w3.org/1999/xhtml" xml:lang="en"
lang="en"><head>

	<meta charset="utf-8">
<meta name="Author" content="Apple Inc.">
<meta name="viewport" content="width=device-width, initial-scale=1,
viewport-fit=cover">
<link rel="shortcut icon" href="/favicon.ico">
<link rel="icon" href="/favicon.ico">
<link rel="mask-icon" href="/apple-logo.svg" color="#333333">

<link rel="stylesheet" href="/assets/styles/global.dist.css?41172203193"
type="text/css">
<link rel="stylesheet" href="/assets/styles/dark-mode.css?41172203193"
type="text/css" media="" data-color-scheme="dark">
<link rel="stylesheet" href="/assets/styles/localization.css?41172203193"
type="text/css">

<script src="/assets/scripts/lib/jquery/jquery-3.6.0.min.js?41172203193"></
script>
<script src="/assets/scripts/settings.js?41172203193"></script>
<script src="/assets/scripts/language-locales.js?41172203193"></script>
<script src="/assets/scripts/DeveloperBreadcrumbs.js?41172203193"></script>

<script async="" src="/assets/scripts/lib/jquery/jquery.retinate.js?
41172203193"></script>
<script async="" src="/assets/scripts/global.js?41172203193"></script>
<script async="" src="/assets/scripts/global-logout.js?41172203193"></script>

	<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Pro&v=2" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Pro+Icons&v=1" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Mono&v=2" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=Apple+Icons&v=1" type="text/css">

	<title>Apple Developer</title>
	<meta name="omni_page" content="Apple Developer - (English)">
	<meta name="Description" content="There’s never been a better time to
develop for Apple platforms.">

```
	<meta property="og:locale" content="en_US">
	<meta property="og:site_name" content="Apple Developer">
	<meta property="og:type" content="website">
	<meta property="og:image"
content="https://developer.apple.com/news/images/og/apple-developer-
og.png">
	<meta property="og:title" content="Apple Developer">
	<meta property="og:description" content="There’s never been a better
time to develop for Apple platforms.">
	<meta property="og:url" content="https://developer.apple.com/">

	<meta name="twitter:card" content="summary_large_image">
	<meta name="twitter:image"
content="https://developer.apple.com/news/images/og/apple-developer-og-
twitter.png">
	<meta name="twitter:description" content="There’s never been a better
time to develop for Apple platforms.">
	<meta name="twitter:title" content="Apple Developer">
	<meta name="twitter:url" content="https://developer.apple.com/">

	<link rel="alternate" href="https://developer.apple.com/" hreflang="en">
	<link rel="alternate" href="https://developer.apple.com/cn/"
hreflang="zh-CN">
	<link rel="alternate" href="https://developer.apple.com/jp/" hreflang="ja-
JP">
	<link rel="alternate" href="https://developer.apple.com/kr/"
hreflang="ko-KR">
	<link rel="canonical" href="https://developer.apple.com/">

	<link rel="stylesheet" href="/assets/styles/router-strip.css">

	<link rel="stylesheet" href="/home/styles/home.css?251722552081"
type="text/css">

</head>
<body id="home" class="dmf" data-color-scheme="dark">

	<link rel="stylesheet" href="/assets/styles/globalnav.css?41172203193"
type="text/css">

<link rel="stylesheet" href="/assets/styles/suggest-lang.css?41172203193"
type="text/css">
<div id="suggest-lang" class="ribbon hide">
	<div class="ribbon-content-wrapper">
		<div class="ribbon-content row">
			<div class="column large-12 large-centered">
				<a id="suggest-closer" class="icon icon-after icon-
reset"></a>
				<p><a href="#" id="suggest-link" class="ribbon-link
more">View in English</a></p>
			</div>
		</div>
	</div>
```

```
</div>
<script src="/assets/scripts/suggest-lang.js?41172203193"></script>
<aside id="ac-gn-segmentbar" class="ac-gn-segmentbar" lang="en-US"
dir="ltr">
</aside>
<input type="checkbox" id="ac-gn-menustate" class="ac-gn-menustate">
<nav id="ac-globalnav" class="js touch no-windows" role="navigation" aria-
label="Global" data-hires="false" data-analytics-region="global nav" lang="en-
US" dir="ltr" data-www-domain="www.apple.com" data-store-locale="us" data-
store-root-path="/us" data-store-api="/[storefront]/shop/bag/status" data-
search-locale="en_US"
data-search-suggestions-api="/search-services/suggestions/" data-search-
defaultlinks-api="/search-services/suggestions/defaultlinks/" data-search-
suggestions-enabled="false">
	<div class="ac-gn-content">
		<ul class="ac-gn-header">
			<li class="ac-gn-item ac-gn-menuicon">
				<label class="ac-gn-menuicon-label" for="ac-gn-
menustate" aria-hidden="true">
					<span class="ac-gn-menuicon-bread ac-gn-
menuicon-bread-top">
						<span class="ac-gn-menuicon-bread-
crust ac-gn-menuicon-bread-crust-top"></span>
					</span>
					<span class="ac-gn-menuicon-bread ac-gn-
menuicon-bread-bottom">
						<span class="ac-gn-menuicon-bread-
crust ac-gn-menuicon-bread-crust-bottom"></span>
					</span>
				</label>
				<a href="#ac-gn-menustate" role="button" class="ac-
gn-menuanchor ac-gn-menuanchor-open" id="ac-gn-menuanchor-open">
					<span class="ac-gn-menuanchor-label">Global
Nav Open Menu</span>
				</a>
				<a href="#" role="button" class="ac-gn-menuanchor
ac-gn-menuanchor-close" id="ac-gn-menuanchor-close">
					<span class="ac-gn-menuanchor-label">Global
Nav Close Menu</span>
				</a>
			</li>
			<li class="ac-gn-item ac-gn-apple">
				<a class="ac-gn-link ac-gn-link-apple-developer"
href="/" data-analytics-title="appledeveloper home" id="ac-gn-firstfocus-
small">
					<span class="ac-gn-link-text">Apple
Developer</span>
				</a>
			</li>
		</ul>
		<div class="ac-gn-search-placeholder-container" role="search">
			<div class="ac-gn-search ac-gn-search-small">
				<a id="ac-gn-link-search-small" class="ac-gn-link"
href="/search/" data-analytics-title="search" data-analytics-click="search" data-
```

analytics-intrapage-link="" aria-label="Search" role="button" aria-haspopup="true">

Search

Cancel

<ul class="ac-gn-list">
<li class="ac-gn-item ac-gn-apple">

Apple Developer

<li class="ac-gn-item ac-gn-item-menu ac-gn-news">

News

<li class="ac-gn-item ac-gn-item-menu ac-gn-discover">

Discover

<li class="ac-gn-item ac-gn-item-menu ac-gn-design">

Design

<li class="ac-gn-item ac-gn-item-menu ac-gn-develop">

Develop


```
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-distribute">
                                <a class="ac-gn-link ac-gn-link-distribute"
href="/distribute/" data-analytics-title="distribute">
                                        <span
class="ac-gn-link-text">Distribute</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-dsupport">
                                <a class="ac-gn-link ac-gn-link-dsupport"
href="/support/" data-analytics-title="dsupport">
                                        <span class="ac-gn-link-text">Support</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-account">
                                <a class="ac-gn-link ac-gn-link-account"
href="/account/" data-analytics-title="account">
                                        <span class="ac-gn-link-text">Account</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-search"
role="search">
                                <a id="ac-gn-link-search" class="ac-gn-link ac-gn-link-
search" href="/search/" data-analytics-title="search" data-analytics-
click="search" data-analytics-intrapage-link="" aria-label="Search"
role="button" aria-haspopup="true"></a>
                        </li>
                </ul>
                <aside id="ac-gn-searchview" class="ac-gn-searchview"
role="search" data-analytics-region="search">
                        <div class="ac-gn-searchview-content">
                                <div class="ac-gn-searchview-bar">
                                        <div class="ac-gn-searchview-bar-wrapper">
                                                <form id="ac-gn-searchform" class="ac-
gn-searchform" action="/search/" method="get">
                                                        <div class="ac-gn-searchform-
wrapper">
                                                                <input id="ac-gn-
searchform-input" class="ac-gn-searchform-input" type="text" name="q" aria-
label="Search" placeholder="Search" autocorrect="off" autocapitalize="off"
autocomplete="off" spellcheck="false" role="combobox" aria-
autocomplete="list" aria-expanded="true" aria-owns="quicklinks suggestions">
                                                                <button id="ac-gn-
searchform-submit" class="ac-gn-searchform-submit" type="submit"
disabled="" aria-label="Submit Search"></button>
                                                                <button id="ac-gn-
searchform-reset" class="ac-gn-searchform-reset" type="reset" disabled=""
aria-label="Clear Search">
                                                                        <span
class="ac-gn-searchform-reset-background"></span>
                                                                </button>
                                                        </div>
                                                </form>
```

```
                                                <button id="ac-gn-searchview-close-small" class="ac-gn-searchview-close ac-gn-searchview-close-small" aria-label="Cancel Search">
                                                                <span class="ac-gn-searchview-close-cancel" aria-hidden="true">
                                                                        Cancel
                                                                </span>
                                                        </button>
                                        </div>
                                </div>
                                <aside id="ac-gn-searchresults" class="ac-gn-searchresults" data-string-quicklinks="Quick Links" data-string-suggestions="Suggested Searches" data-string-noresults="">
                        <section class="ac-gn-searchresults-section ac-gn-searchresults-section-defaultlinks">
                                <div class="ac-gn-searchresults-section-wrapper">
                                                <div class="search-group-checkbox hidden"><input id="group-input" type="checkbox" name="group-filter" checked="">Only search within “<span id="group-search-label"></span>”</div>
                                        <h3 class="ac-gn-searchresults-header ac-gn-searchresults-animated">Quick Links</h3>
                                        <ul class="ac-gn-searchresults-list" id="defaultlinks" role="listbox">
                                        <li class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a href="https://developer.apple.com/ios/" id="search-group-link-0" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">iOS 16</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a href="https://developer.apple.com/news/" id="search-group-link-1" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">Latest News</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a href="https://developer.apple.com/documentation/storekit/appstore/environment/3963900-xcode/" id="search-group-link-2" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">xcode</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a href="https://developer.apple.com/xcode/whats-new/" id="search-group-link-3" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">What’s included in Xcode</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a href="https://developer.apple.com/videos/play/wwdc2022/110345/" id="search-group-link-4" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">What’s new in Endpoint Security</a></li></ul>
                                        <span role="status" class="ac-gn-searchresults-count" aria-live="polite">5 Quick Links</span>
                                </div>
                        </section>
                </aside>
                                </div>
                                <button id="ac-gn-searchview-close" class="ac-gn-searchview-close" aria-label="Cancel Search">
                                                <span class="ac-gn-searchview-close-wrapper">
```

```
                                                <span class="ac-gn-searchview-close-
left"></span>
                                                <span class="ac-gn-searchview-close-
right"></span>
                                        </span>
                                </button>
                        </aside>
                                </div>
</nav>
<div class="ac-gn-blur"></div>
<div id="ac-gn-curtain" class="ac-gn-curtain"></div>
<div id="ac-gn-placeholder" class="ac-nav-placeholder"></div>
<script src="/assets/scripts/ac-globalnav.built.js?41172203193"></script><div
id="ac-gn-viewport-emitter"> </div>
<link rel="stylesheet" href="/assets/styles/search.css?41172203193">
<script src="/assets/scripts/search.js?41172203193"></script>

        <!-- metrics -->
<script>
   /* RSID: */
   var s_account="awdappledeveloper"
</script>
<script src="/assets/metrics/scripts/analytics.js?10202020"></script>
<script>
   s.pageName= AC && AC.Tracking && AC.Tracking.pageName();
   s.channel="www.en.developer"
   s.channel="www.en.developer";


   /************* DO NOT ALTER ANYTHING BELOW THIS LINE ! **************/
   var s_code=s.t();if(s_code)document.write(s_code)
</script>
<!-- /metrics -->

        <main class="main">

                <section class="homepage-section section-heroes">
          <ul class="homepage-section-positions hero-positions">
                <li class="homepage-section-item hero-position hero-position-ios-
16">
                <div class="hero hero-ios-16 promo-managed-unit">
                   <div class="unit-wrapper unit-wrapper-reverse">
                      <a href="/whats-new/" class="unit-link" tabindex="0"><span
class="visuallyhidden unit-link-vo"></span></a>
                      <div class="unit-image-wrapper">
                                                        <picture>
                                                                <source
srcset="/home/images/hero-ios-16/ios-16-large_2x.webp" type="image/webp">
                                                                <img class="unit-
image unit-image-ios-16" src="/home/images/hero-ios-16/ios-16-large_2x.png?1"
alt="" data-hires-status="pending">
                                                        </picture>
                      </div>
                      <div class="unit-copy-wrapper">
```

```
                        <h4 class="headline"><span class="nowrap">Find out
what’s new for<br>Apple developers</span></h4>
                    </div>
                  </div>
                </div>
              </li>
            </ul>
        </section>

                <section class="homepage-section section-promos">
                        <ul class="homepage-section-positions promo-positions">
                                <li class="homepage-section-item promo-position
promo-position-1 homepage-section-item-app-store-sessions theme-dark" data-
promo-type="show-hide" data-hires-status="pending">
                                        <div class="promo promo-managed-unit">
                                                <div class="unit-wrapper">
                                                        <a class="unit-link"
href="/events/app-store/" tabindex="0"><span
class="visuallyhidden"></span></a>
                                                        <div class="unit-copy-wrapper">
                                                                <h4 class="headline">Meet
with <span class="nowrap">App Store experts</span></h4>
                                                                <h5
class="subhead">Connect with Apple experts online to learn how to make the
most of App Store features.</h5>
                                                        </div>
                                                        <div class="unit-image-wrapper
image-constraints-full">
                                                                <img class="unit-image
unit-image-centered" src="/home/images/tile-app-store-sessions/app-store-
sessions.svg" alt="" width="200" height="auto" data-hires-status="pending">
                                                        </div>
                                                </div>
                                        </div>
                                </li>

                                <li class="homepage-section-item promo-position
promo-position-1 homepage-section-item-hero-ada22" data-promo-type="show-
hide">
                                        <div class="promo promo-managed-unit">
                                                <div class="unit-wrapper">
                                                        <a class="unit-link"
href="/design/awards/" tabindex="0"><span
class="visuallyhidden"></span></a>
                                                        <div class="unit-copy-wrapper
unit-copy-hero-ada22 wylde" id="ada22-winners-text">
                                                                <h4
class="headline"><span class="nowrap">Apple Design Awards</span></h4>
                                                                <h5
class="subhead">Discover this year's winners.</h5>
                                                        </div>
                                                        <div class="unit-image-wrapper
image-constraints-full">
```

```
                                                                <figure class="unit-image
unit-image-ada22-winners wylde" id="ada22-winners" data-hires-
status="pending"></figure>
                                                                </div>
                                                        </div>
                                                        <script
src="/home/scripts/adaWinnersPicker.js?06172203193"></script>
                                                </div>
                                        </li>

                                        <li class="homepage-section-item promo-position
homepage-section-item-ios-15" data-promo-type="show-hide">
                                                <div class="promo promo-managed-unit">
                                                        <div class="unit-wrapper">
                                                                <a class="unit-link" href="/ios/"
tabindex="0"><span class="visuallyhidden"></span></a>

                                                                <div class="unit-copy-wrapper">
                                                                        <h4 class="headline">iOS
16</h4>
                                                                </div>

                                                                <div class="unit-image-wrapper
image-constraints-full">
                                                                        <img class="unit-image
unit-image-centered"
src="https://developer.apple.com/home/images/tile-ios-16/ios-16-large_2x.png?
1" alt="" width="151" height="300" data-hires-status="pending">
                                                                </div>
                                                        </div>
                                                </div>
                                        </li>

                                        <li class="homepage-section-item promo-position
homepage-section-item-ipados-15" data-promo-type="show-hide">
                                                <div class="promo promo-managed-unit">
                                                        <div class="unit-wrapper">
                                                                <a class="unit-link"
href="/ipados/" tabindex="0"><span class="visuallyhidden"></span></a>

                                                                <div class="unit-copy-wrapper">
                                                                        <h4
class="headline">iPadOS 16</h4>
                                                                </div>

                                                                <div class="unit-image-wrapper
image-constraints-full">
                                                                        <img class="unit-image
unit-image-centered" src="https://developer.apple.com/home/images/tile-ipados-
16/ipados-16-large_2x.png?1" alt="" width="439" height="318" data-hires-
status="pending">
                                                                </div>
                                                        </div>
                                                </div>
```

```
                                </li>


                                <li class="homepage-section-item promo-position
homepage-section-item-macos-12" data-promo-type="show-hide">
                                        <div class="promo promo-managed-unit">
                                                <div class="unit-wrapper">
                                                        <a class="unit-link" href="/macos/"
tabindex="0"><span class="visuallyhidden"></span></a>

                                                        <div class="unit-copy-wrapper">
                                                                <h4
class="headline">macOS 13</h4>
                                                        </div>

                                                        <div class="unit-image-wrapper
image-constraints-full">
                                                                <img class="unit-image
unit-image-centered" src="https://developer.apple.com/home/images/tile-macos-
13/macos-13-large_2x.png" alt="" width="576" height="336" data-hires-
status="pending">
                                                        </div>
                                                </div>
                                        </div>
                                </li>

                                <li class="homepage-section-item promo-position
homepage-section-item-watchos-8" data-promo-type="show-hide">
                                        <div class="promo promo-managed-unit">
                                                <div class="unit-wrapper">
                                                        <a class="unit-link"
href="/watchos/" tabindex="0"><span class="visuallyhidden"></span></a>

                                                        <div class="unit-copy-wrapper">
                                                                <h4
class="headline">watchOS 9</h4>
                                                        </div>

                                                        <div class="unit-image-wrapper
image-constraints-full">
                                                                <img class="unit-image
unit-image-centered" src="https://developer.apple.com/home/images/tile-
watchos-9/watchos-9-large_2x.png?1" alt="" width="191" height="319" data-
hires-status="pending">
                                                        </div>
                                                </div>
                                        </div>
                                </li>
                        </ul>
                </section>

                <section class="homepage-section section-heroes">
            <ul class="homepage-section-positions hero-positions">
                <li class="homepage-section-item hero-position">
```

```
                <div class="hero hero-wwdc22 promo-managed-unit theme-dark">
                    <div class="unit-wrapper unit-wrapper-reverse">
                        <a href="/videos/wwdc2022/" class="unit-link"
tabindex="0"><span class="visuallyhidden unit-link-vo"></span></a>
                        <div class="unit-copy-wrapper">
                            <div><img class="hero-masthead" alt="WWDC22"
src="/wwdc22/images/masthead-22-blue.svg" role="img" data-hires-
status="pending"></div>
                                                                <h4 class="headline
visuallyhidden"><span class="nowrap">WWDC22</span></h4>
                            <h5 class="subhead">Watch the session videos.</h5>
                        </div>
                        <div class="unit-image-wrapper image-constraints-full">
                            <figure class="unit-image unit-image-hero-wwdc22  unit-
hero-wwdc22-item-3" data-hires-status="pending"></figure>
                        </div>
                    </div>
                </div>
            </li>
        </ul>
    </section>

                <section class="section section-build-apps theme-dark" data-hires-
status="pending">
                        <div class="unit-wrapper">
                                <a class="unit-link" href="/learn/"
tabindex="0"><span class="visuallyhidden"></span></a>
                                <div class="section-content">
                                        <div class="row">
                                                <div class="column large-centered large-
7 medium-7 small-12 text-center">
                                                        <h2>Build apps. Build your
future.</h2>
                                                        <h5 class="subhead">Whether
you’re just entering the workforce or you‘re an experienced developer or
entrepreneur, take advantage of free resources to gain skills that help you
succeed in Apple’s growing app economy, which provides millions of jobs
in technology across the globe.</h5>
                                                </div>
                                        </div>
                                </div>
                                <figure class="hero-build-apps center" data-hires-
status="pending"></figure>
                        </div>
                </section>
                <section class="section section-adp theme-dark" data-hires-
status="pending">
                        <div class="unit-wrapper">
                                <a class="unit-link" href="/programs/"
tabindex="0"><span class="visuallyhidden"></span></a>
                                <div class="section-content">
                                        <div class="row">
                                                <div class="column large-centered large-
7 medium-7 small-12 text-center">
```

```
                                                <img
src="/app-store/features/images/members.svg" width="144" alt="" data-hires-
status="pending">
                                                <h2>Apple Developer
Program</h2>
                                                <h5 class="subhead">Join the
<span class="nowrap">Apple Developer</span> Program to reach customers
around the world on the <span class="nowrap">App Store</span> for iPhone,
iPad, Mac, <span class="nowrap">Apple Watch,</span> <span
class="nowrap">Apple TV,</span> and iMessage. You'll also get access to beta
software, advanced app capabilities, extensive beta testing tools, and
app analytics.</h5>
                                        </div>
                                    </div>
                                </div>
                            </div>
                        </section>
                    </main>

                    <aside class="section developer-router-links">
                        <div class="section-content">
                            <div class="row">
                                <div class="column large-3 medium-6 small-6">
                                    <a href="/news/" class="block text-center">
                                        <figure class="router-icon router-icon-
news" data-hires-status="pending"></figure>
                                        <p><strong>News and
Updates</strong></p>
                                        <p class="typography-subbody">See the
latest announcements and recommendations for Apple developers.</p>
                                        <p class="typography-subbody"><span
class="block-link more">View the latest</span></p>
                                    </a>
                                </div>
                                <div class="column large-3 medium-6 small-6">
                                    <a
href="https://developer.apple.com/download/" class="block text-center">
                                        <figure class="router-icon router-icon-
download" data-hires-status="pending">></figure>
                                        <p><strong>Software
Downloads</strong></p>
                                        <p class="typography-subbody">Get the
latest releases of Xcode, iOS, iPadOS, macOS, tvOS, watchOS,
and more.</p>
                                        <p class="typography-subbody"><span
class="block-link more">Download resources</span></p>
                                    </a>
                                </div>
                                <div class="column large-3 medium-6 small-6">
                                    <a href="/documentation/" class="block text-
center">
                                        <figure class="router-icon router-icon-
documentation" data-hires-status="pending">></figure>
```

```
        <p><strong>Documentation</strong></p>
                                        <p class="typography-subbody">Browse
the latest documentation including API reference, articles, and
sample code.</p>
                                        <p class="typography-subbody"><span
class="block-link more">Read API documentation</span></p>
                                    </a>
                                </div>
                                <div class="column large-3 medium-6 small-6">
                                    <a href="/videos/" class="block text-center">
                                        <figure class="router-icon router-icon-
videos" data-hires-status="pending"></figure>
                                        <p><strong>Videos</strong></p>
                                        <p class="typography-
subbody">Discover the latest in Apple technologies presented at WWDC and
other events.</p>
                                        <p class="typography-subbody"><span
class="block-link more">Watch videos</span></p>
                                    </a>
                                </div>
                            </div>
                        </div>
        </aside>

        <link rel="stylesheet" href="/assets/styles/footer.dist.css?
41172203193">
<footer id="footer" class="footer" role="contentinfo" aria-labelledby="footer-
label">
    <div class="footer-content">
        <h2 class="footer-label" id="footer-label">Developer Footer</h2>
                <nav class="footer-directory" aria-label="Apple Developer Directory"
role="navigation">
        <!--googleoff: all-->
        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-platform">
                <div class="footer-directory-column-section">
                    <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-platform">
                        <h3 class="footer-directory-column-section-
title">Platforms</h3>
                    </label>
                    <a href="#footer-directory-column-section-state-platform"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                    <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                    <ul class="footer-directory-column-section-list">
                        <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ios/">iOS</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ipados/">iPadOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/macos/">macOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tvos/">tvOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/watchos/">watchOS</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-tools">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-tools">
                                <h3 class="footer-directory-column-section-
title">Tools</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-tools"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift/">Swift</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swiftui/">SwiftUI</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift-playgrounds/">Swift
Playgrounds</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/testflight/">TestFlight</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode/">Xcode</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode-cloud/">Xcode
Cloud</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/sf-symbols/">SF
Symbols</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-topics">
                <div class="footer-directory-column-section">
```

```
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-topics">
                                <h3 class="footer-directory-column-section-
title">Topics &amp; Technologies</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-topics"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessibility/">Accessibility</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessories/">Accessories</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-extensions/">App
Extensions</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/">App
Store</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/audio/">Audio &amp;
Video</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/augmented-
reality/">Augmented Reality</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/business/">Business</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/">Design</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/distribute/">Distribution</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/education/">Education</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/fonts/">Fonts</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/games/">Games</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/health-fitness/">Health
&amp; Fitness</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/in-app-purchase/">In-App
Purchase</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/localization/">Localization</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/maps/">Maps &amp;
Location</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/machine-learning/">Machine
Learning</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/security/">Security</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/safari/">Safari &amp;
Web</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-resources">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-resources">
                                <h3 class="footer-directory-column-section-
title">Resources</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-resources"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/documentation/">Documentation</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/curriculum/">Curriculum</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/download/">Downloads</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://developer.apple.com/forums/">Forums</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/videos/">Videos</a></li>
                        </ul>
                </div>
```

```
<input class="footer-directory-column-section-state" type="checkbox" id="footer-directory-column-section-state-support">
<div class="footer-directory-column-section">
<label class="footer-directory-column-section-label" for="footer-directory-column-section-state-support">
<h3 class="footer-directory-column-section-title">Support</h3>
</label>
<a href="#footer-directory-column-section-state-support" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-open"> <span class="footer-directory-column-section-anchor-label">Open Menu</span> </a>
<a href="#" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-close"> <span class="footer-directory-column-section-anchor-label">Close Menu</span> </a>
<ul class="footer-directory-column-section-list">
<li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/support/articles/">Support Articles</a></li>
<li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/contact/">Contact Us</a></li>
<li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/bug-reporting/">Bug Reporting</a></li>
<li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/system-status/">System Status</a></li>
</ul>
</div>

<input class="footer-directory-column-section-state" type="checkbox" id="footer-directory-column-section-state-account">
<div class="footer-directory-column-section">
<label class="footer-directory-column-section-label" for="footer-directory-column-section-state-account">
<h3 class="footer-directory-column-section-title">Account</h3>
</label>
<a href="#footer-directory-column-section-state-account" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-open"> <span class="footer-directory-column-section-anchor-label">Open Menu</span> </a>
<a href="#" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-close"> <span class="footer-directory-column-section-anchor-label">Close Menu</span> </a>
<ul class="footer-directory-column-section-list">
<li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/account/">Apple Developer</a></li>
<li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="https://appstoreconnect.apple.com/">App Store Connect</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/account/ios/certificate/">Certificates, IDs, &amp; Profiles</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://feedbackassistant.apple.com/">Feedback Assistant</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-programs">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-programs">
                                <h3 class="footer-directory-column-section-
title">Programs</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-programs"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/">Apple Developer
Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/enterprise/">Apple
Developer Enterprise Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/small-business-
program/">App Store Small Business Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="https://mfi.apple.com/">MFi
Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/news-
partner/">News Partner Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/video-
partner/">Video Partner Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/security-bounty/">Security
Bounty Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/security-research-
device/">Security Research Device Program</a></li>
                        </ul>
                </div>
```

```
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-events">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-events">
                                <h3 class="footer-directory-column-section-
title">Events</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-events"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/accelerator/">App
Accelerators</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/app-store-
awards/">App Store Awards</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/awards/">Apple
Design Awards</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/experts/#academies">Apple Developer Academies</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/entrepreneur-
camp/">Entrepreneur Camp</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tech-talks/">Tech
Talks</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/wwdc/">WWDC</a></li>
                        </ul>
                </div>
        </div>
        <!--googleon: all-->
</nav>
      <section class="footer-mini" vocab="http://schema.org/"
typeof="Organization">
        <div class="footer-mini-news">
                <div class="copy">
                        To view the latest developer news, visit <a
href="/news/">News and Updates</a>.
                </div>
                <div class="content">
                        <div class="color-scheme-toggle" role="radiogroup"
tabindex="0" aria-label="Select a color scheme preference">

                                <label data-color-scheme-option="light">
```

```
                                        <input type="radio" value="light"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Light</div>

                                </label>

                                <label data-color-scheme-option="dark">

                                        <input type="radio" value="dark"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Dark</div>

                                </label>

                                <label data-color-scheme-option="auto">

                                        <input type="radio" value="auto"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Auto</div>

                                </label>

                        </div>
                        <script async="" src="/assets/scripts/color-scheme-
toggle.js"></script>
                </div>
        </div>
        <link rel="stylesheet" href="/assets/styles/language-dropdown.css?
41172203193">
        <div class="language-dropdown dropdown-container" data-
lang="complete">
                <select class="dropdown" aria-label="Language
Dropdown"><option
value="https://developer.apple.com/">English</option><option
value="https://developer.apple.com/cn/">□□□□</option><option
value="https://developer.apple.com/jp/">□□□</option><option
value="https://developer.apple.com/kr/">□□□</option></select>
                <span class="dropdown-icon icon icon-chevrondown" aria-
hidden="true"></span>
        </div>
        <script async="" src="/assets/scripts/lib/jquery/jquery.language-
dropdown.js?41172203193"></script>
        <div class="footer-mini-legal">
                <div class="footer-mini-legal-copyright">Copyright © 2022 <a
href="https://www.apple.com">Apple Inc.</a> All rights reserved.</div>
                <div class="footer-mini-legal-links">
```

```
                        <a class="footer-mini-legal-link"
href="https://www.apple.com/legal/internet-services/terms/site.html">Terms of
Use</a>
                        <a class="footer-mini-legal-link"
href="https://www.apple.com/legal/privacy/en-ww/">Privacy Policy</a>
                        <a class="footer-mini-legal-link"
href="/support/terms/">Agreements and Guidelines</a>
                </div>
        </div>
</section>
   </div>
</footer>


</body></html>

<html xmlns="https://www.w3.org/1999/xhtml" xml:lang="en" lang="en"
class="js touch svg no-ie8 progressive-image"><head>
        <meta charset="utf-8">
<meta name="Author" content="Apple Inc.">
<meta name="viewport" content="width=device-width, initial-scale=1,
viewport-fit=cover">
<link rel="shortcut icon" href="/favicon.ico">
<link rel="icon" href="/favicon.ico">
<link rel="mask-icon" href="/apple-logo.svg" color="#333333">

<link rel="stylesheet" href="/assets/styles/global.dist.css?41172203193"
type="text/css">
<link rel="stylesheet" href="/assets/styles/dark-mode.css?41172203193"
type="text/css" media="" data-color-scheme="dark">
<link rel="stylesheet" href="/assets/styles/localization.css?41172203193"
type="text/css">

<script src="/assets/scripts/lib/jquery/jquery-3.6.0.min.js?41172203193"></
script>
<script src="/assets/scripts/settings.js?41172203193"></script>
<script src="/assets/scripts/language-locales.js?41172203193"></script>
<script src="/assets/scripts/DeveloperBreadcrumbs.js?41172203193"></script>

<script async="" src="/assets/scripts/lib/jquery/jquery.retinate.js?
41172203193"></script>
<script async="" src="/assets/scripts/global.js?41172203193"></script>
<script async="" src="/assets/scripts/global-logout.js?41172203193"></script>

        <link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Pro&amp;v=2" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Pro+Icons&amp;v=1" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Mono&amp;v=2" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=Apple+Icons&amp;v=1" type="text/css">

        <title>Develop - Apple Developer</title>
```

```
	<meta name="omni_page" content="Develop - (English)">
	<meta name="Description" content="Get tools and resources for
developing apps with Apple technologies.">

	<link rel="stylesheet" type="text/css" href="/develop/styles/develop-
alt.css?Tuesday, 12-Jul-2022 17:03:53 GMT">
	<link rel="stylesheet" type="text/css" href="/develop/styles/banners.css?
Tuesday, 12-Jul-2022 17:03:53 GMT">

	<link rel="alternate" href="https://developer.apple.com/develop/"
hreflang="en">
	<link rel="alternate" href="https://developer.apple.com/cn/develop/"
hreflang="zh-CN">
	<link rel="alternate" href="https://developer.apple.com/jp/develop/"
hreflang="ja-JP">
	<link rel="alternate" href="https://developer.apple.com/kr/develop/"
hreflang="ko-KR">
	<link rel="canonical" href="https://developer.apple.com/develop/">
</head>
<body id="develop" class="nav-develop chapternav-overlap dmf" data-color-
scheme="dark">

	<link rel="stylesheet" href="/assets/styles/globalnav.css?41172203193"
type="text/css">

<link rel="stylesheet" href="/assets/styles/suggest-lang.css?41172203193"
type="text/css">
<div id="suggest-lang" class="ribbon hide">
	<div class="ribbon-content-wrapper">
		<div class="ribbon-content row">
			<div class="column large-12 large-centered">
				<a id="suggest-closer" class="icon icon-after icon-
reset"></a>
				<p><a href="#" id="suggest-link" class="ribbon-link
more">View in English</a></p>
			</div>
		</div>
	</div>
</div>
<script src="/assets/scripts/suggest-lang.js?41172203193"></script>
<aside id="ac-gn-segmentbar" class="ac-gn-segmentbar" lang="en-US"
dir="ltr">
</aside>
<input type="checkbox" id="ac-gn-menustate" class="ac-gn-menustate">
<nav id="ac-globalnav" class="js touch no-windows" role="navigation" aria-
label="Global" data-hires="false" data-analytics-region="global nav" lang="en-
US" dir="ltr" data-www-domain="www.apple.com" data-store-locale="us" data-
store-root-path="/us" data-store-api="/[storefront]/shop/bag/status" data-
search-locale="en_US"
data-search-suggestions-api="/search-services/suggestions/" data-search-
defaultlinks-api="/search-services/suggestions/defaultlinks/" data-search-
suggestions-enabled="false">
	<div class="ac-gn-content">
		<ul class="ac-gn-header">
```

```
                <li class="ac-gn-item ac-gn-menuicon">
                        <label class="ac-gn-menuicon-label" for="ac-gn-
menustate" aria-hidden="true">
                                <span class="ac-gn-menuicon-bread ac-gn-
menuicon-bread-top">
                                        <span class="ac-gn-menuicon-bread-
crust ac-gn-menuicon-bread-crust-top"></span>
                                </span>
                                <span class="ac-gn-menuicon-bread ac-gn-
menuicon-bread-bottom">
                                        <span class="ac-gn-menuicon-bread-
crust ac-gn-menuicon-bread-crust-bottom"></span>
                                </span>
                        </label>
                        <a href="#ac-gn-menustate" role="button" class="ac-
gn-menuanchor ac-gn-menuanchor-open" id="ac-gn-menuanchor-open">
                                <span class="ac-gn-menuanchor-label">Global
Nav Open Menu</span>
                        </a>
                        <a href="#" role="button" class="ac-gn-menuanchor
ac-gn-menuanchor-close" id="ac-gn-menuanchor-close">
                                <span class="ac-gn-menuanchor-label">Global
Nav Close Menu</span>
                        </a>
                </li>
                <li class="ac-gn-item ac-gn-apple">
                        <a class="ac-gn-link ac-gn-link-apple-developer"
href="/" data-analytics-title="appledeveloper home" id="ac-gn-firstfocus-
small">
                                <span class="ac-gn-link-text">Apple
Developer</span>
                        </a>
                </li>
        </ul>
        <div class="ac-gn-search-placeholder-container" role="search">
                <div class="ac-gn-search ac-gn-search-small">
                        <a id="ac-gn-link-search-small" class="ac-gn-link"
href="/search/" data-analytics-title="search" data-analytics-click="search" data-
analytics-intrapage-link="" aria-label="Search" role="button" aria-
haspopup="true">
                                <div class="ac-gn-search-placeholder-bar">
                                        <div class="ac-gn-search-placeholder-
input">
                                                <div class="ac-gn-search-
placeholder-input-text" aria-hidden="true">
                                                        <div class="ac-gn-link-
search ac-gn-search-placeholder-input-icon"></div>
                                                        <span class="ac-gn-search-
placeholder">Search</span>
                                                </div>
                                        </div>
                                        <div class="ac-gn-searchview-close ac-
gn-searchview-close-small ac-gn-search-placeholder-searchview-close">
```

```
                                                <span class="ac-gn-searchview-
close-cancel" aria-hidden="true">Cancel</span>
                                                </div>
                                        </div>
                                </a>
                        </div>
                </div>
                <ul class="ac-gn-list">
                        <li class="ac-gn-item ac-gn-apple">
                                <a class="ac-gn-link ac-gn-link-apple-developer"
href="/" data-analytics-title="appledeveloper home" id="ac-gn-firstfocus">
                                        <span class="ac-gn-link-text">Apple
Developer</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-news">
                                <a class="ac-gn-link ac-gn-link-news" href="/news/"
data-analytics-title="news">
                                        <span class="ac-gn-link-text">News</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-discover">
                                <a class="ac-gn-link ac-gn-link-discover"
href="/discover/" data-analytics-title="discover">
                                        <span
class="ac-gn-link-text">Discover</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-design">
                                <a class="ac-gn-link ac-gn-link-design" href="/design/"
data-analytics-title="design">
                                        <span class="ac-gn-link-text">Design</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-develop">
                                <a class="ac-gn-link ac-gn-link-develop"
href="/develop/" data-analytics-title="develop">
                                        <span class="ac-gn-link-text">Develop</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-distribute">
                                <a class="ac-gn-link ac-gn-link-distribute"
href="/distribute/" data-analytics-title="distribute">
                                        <span
class="ac-gn-link-text">Distribute</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-dsupport">
                                <a class="ac-gn-link ac-gn-link-dsupport"
href="/support/" data-analytics-title="dsupport">
                                        <span class="ac-gn-link-text">Support</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-account">
```

```
                                <a class="ac-gn-link ac-gn-link-account"
href="/account/" data-analytics-title="account">
                                        <span class="ac-gn-link-text">Account</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-search"
role="search">
                                <a id="ac-gn-link-search" class="ac-gn-link ac-gn-link-
search" href="/search/" data-analytics-title="search" data-analytics-
click="search" data-analytics-intrapage-link="" aria-label="Search"
role="button" aria-haspopup="true"></a>
                        </li>
                </ul>
                <aside id="ac-gn-searchview" class="ac-gn-searchview"
role="search" data-analytics-region="search">
                        <div class="ac-gn-searchview-content">
                                <div class="ac-gn-searchview-bar">
                                        <div class="ac-gn-searchview-bar-wrapper">
                                                <form id="ac-gn-searchform" class="ac-
gn-searchform" action="/search/" method="get">
                                                        <div class="ac-gn-searchform-
wrapper">
                                                                <input id="ac-gn-
searchform-input" class="ac-gn-searchform-input" type="text" name="q" aria-
label="Search" placeholder="Search" autocorrect="off" autocapitalize="off"
autocomplete="off" spellcheck="false" role="combobox" aria-
autocomplete="list" aria-expanded="true" aria-owns="quicklinks suggestions">
                                                                <button id="ac-gn-
searchform-submit" class="ac-gn-searchform-submit" type="submit"
disabled="" aria-label="Submit Search"></button>
                                                                <button id="ac-gn-
searchform-reset" class="ac-gn-searchform-reset" type="reset" disabled=""
aria-label="Clear Search">
                                                                        <span
class="ac-gn-searchform-reset-background"></span>
                                                                </button>
                                                        </div>
                                                </form>
                                                <button id="ac-gn-searchview-close-
small" class="ac-gn-searchview-close ac-gn-searchview-close-small" aria-
label="Cancel Search">
                                                                <span class="ac-gn-
searchview-close-cancel" aria-hidden="true">
                                                                        Cancel
                                                                </span>
                                                        </button>
                                        </div>
                                </div>
                                <aside id="ac-gn-searchresults" class="ac-gn-
searchresults" data-string-quicklinks="Quick Links" data-string-
suggestions="Suggested Searches" data-string-noresults="">
                        <section class="ac-gn-searchresults-section ac-gn-searchresults-
section-defaultlinks">
                                <div class="ac-gn-searchresults-section-wrapper">
```

```
                                                    <div class="search-group-
checkbox hidden"><input id="group-input" type="checkbox" name="group-
filter" checked="">Only search within “<span
id="group-search-label"></span>”</div>
                        <h3 class="ac-gn-searchresults-header ac-gn-searchresults-
animated">Quick Links</h3>
                        <ul class="ac-gn-searchresults-list" id="defaultlinks"
role="listbox">
                        <li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a href="https://developer.apple.com/ios/" id="search-group-link-0"
class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">iOS
16</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a href="https://developer.apple.com/news/" id="search-group-link-
1" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">Latest
News</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a
href="https://developer.apple.com/documentation/storekit/appstore/
environment/3963900-xcode/" id="search-group-link-2" class="ac-gn-
searchresults-link ac-gn-searchresults-link-defaultlinks">xcode</a></li><li
class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a
href="https://developer.apple.com/xcode/whats-new/" id="search-group-link-3"
class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">What’s
included in Xcode</a></li><li class="ac-gn-searchresults-item ac-gn-
searchresults-animated"><a
href="https://developer.apple.com/videos/play/wwdc2022/110345/" id="search-
group-link-4" class="ac-gn-searchresults-link ac-gn-searchresults-link-
defaultlinks">What’s new in Endpoint Security</a></li></ul>
                        <span role="status" class="ac-gn-searchresults-count" aria-
live="polite">5 Quick Links</span>
                    </div>
                </section>
            </aside>
                        </div>
                        <button id="ac-gn-searchview-close" class="ac-gn-
searchview-close" aria-label="Cancel Search">
                                        <span class="ac-gn-searchview-close-
wrapper">
                                                <span class="ac-gn-searchview-close-
left"></span>
                                                <span class="ac-gn-searchview-close-
right"></span>
                                        </span>
                                    </button>
                </aside>
                        </div>
</nav>
<div class="ac-gn-blur"></div>
<div id="ac-gn-curtain" class="ac-gn-curtain"></div>
<div id="ac-gn-placeholder" class="ac-nav-placeholder"></div>
<script src="/assets/scripts/ac-globalnav.built.js?41172203193"></script><div
id="ac-gn-viewport-emitter"> </div>
<link rel="stylesheet" href="/assets/styles/search.css?41172203193">
<script src="/assets/scripts/search.js?41172203193"></script>
```

```
        <!-- metrics -->
<script>
   /* RSID: */
   var s_account="awdappledeveloper"
</script>
<script src="/assets/metrics/scripts/analytics.js?10202020"></script>
<script>
   s.pageName= AC && AC.Tracking && AC.Tracking.pageName();
   s.channel="www.en.developer"
   s.channel="www.en.developer";


   /************* DO NOT ALTER ANYTHING BELOW THIS LINE ! **************/
   var s_code=s.t();if(s_code)document.write(s_code)
</script>
<!-- /metrics -->

        <link rel="stylesheet" property="stylesheet"
href="/assets/styles/chapternav.css" type="text/css">
<nav id="chapternav" class="chapternav theme-dark">
        <div class="chapternav-wrapper">
                <ul class="chapternav-items">
                        <li class="chapternav-item chapternav-item-xcode">
                                <a class="chapternav-link" href="/xcode/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span class="chapternav-label">Xcode</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-xcode-cloud">
                                <a class="chapternav-link" href="/xcode-cloud/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span class="chapternav-label">Xcode
Cloud</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-swift">
                                <a class="chapternav-link" href="/swift/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span class="chapternav-label">Swift</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-swiftui">
                                <a class="chapternav-link" href="/xcode/swiftui/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span
class="chapternav-label">SwiftUI</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-testflight">
                                <a class="chapternav-link" href="/testflight/">
```

```
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span
class="chapternav-label">TestFlight</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-
documentation">
                                <a class="chapternav-link" href="/documentation/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span class="chapternav-
label">Documentation</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-videos">
                                <a class="chapternav-link" href="/videos/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span
class="chapternav-label">Videos</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-downloads">
                                <a class="chapternav-link" href="/download/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span
class="chapternav-label">Downloads</span>
                                </a>
                        </li>
                </ul>
                <div class="chapternav-paddles">
                        <button class="chapternav-paddle chapternav-paddle-left"
aria-hidden="true" disabled=""></button>
                        <button class="chapternav-paddle chapternav-paddle-right"
aria-hidden="true" disabled=""></button>
                </div>
        </div>
</nav>
<link rel="stylesheet"
href="/assets/includes/resources-chapter-nav/styles/resources-chapter-
nav.css">
<script src="/assets/scripts/chapternav.js"></script>


        <main id="main" class="main" role="main">

                <div class="ribbon ribbon-blue">
                        <div class="ribbon-drop-wrapper">
                                <div class="ribbon-content-wrapper">
                                        <div class="ribbon-content row">
                                                <div class="column large-centered large-
12">
```

```
                                                <p>
                                                        <a href="/whats-new/"
class="ribbon-link">Find out what’s new for <span class="nowrap more">Apple
developers</span></a>
                                                </p>
                                        </div>
                                </div>
                        </div>
                </div>
        </div>

        <header class="section section-header bg-gradient"
role="presentation">
                <div class="section-content">
                        <div class="row">
                                <div class="column large-8 medium-10 small-
12 large-centered text-center">
                                        <figure class="icon-sdk center" data-
hires-status="pending"></figure>
                                        <h1 class="typography-headline">Bring
your ideas to life</h1>
                                        <p class="typography-intro">With the
power of Xcode, the ease of Swift, and the revolutionary features of cutting-edge
Apple technologies, you have the freedom to create your most innovative apps
ever.</p>
                                </div>
                        </div>
                </div>
                <figure class="device-hero device-image device-macbook-
pro-space-grey center" data-hires-status="pending" style="background-image:
url(&quot;https://developer.apple.com/assets/elements/hardware/macbook_pro_s
pace_grey/small_2x.png?156454&quot;);">
                        <figure class="device-screen screen-hero" data-hires-
status="pending"></figure>
                </figure>
        </header>

        <section class="section section-xcode">
                <div class="section-content">
                        <div class="row">
                                <div class="inner-content large-centered large-
6 medium-8 small-12 text-center">
                                        <figure class="icon-xcode center" data-
hires-status="pending"></figure>
                                        <h2 class="typography-section-
headline">Xcode</h2>
                                        <p>The Xcode developer tools include
everything you need to create apps for iOS, iPadOS, macOS, tvOS, and
watchOS.</p>
                                        <p><a href="/xcode/"
class="more">What’s new in Xcode</a></p>
                                </div>
                        </div>
                </div>
```

```
		</section>

		<div class="row">
			<section class="section side-by-side section-swift" data-
hires-status="pending">
				<div class="section-content">
					<a href="/swift/" class="block">
						<figure class="icon-swift" data-hires-
status="pending"></figure>
						<h2 class="typography-section-
headline">Swift</h2>
						<p>This robust yet intuitive programming
language for Apple platforms makes it easier than ever to write great code.</p>
						<p><span class="block-link
more">What’s new in Swift</span></p>
					</a>
				</div>
			</section>
			<section class="section side-by-side section-swiftui" data-
hires-status="pending">
				<div class="section-content">
					<a href="/xcode/swiftui/" class="block">
						<figure class="icon-swiftui" data-hires-
status="pending"></figure>
						<h2 class="typography-section-
headline">SwiftUI</h2>
						<p>SwiftUI helps you build great looking
apps across all Apple platforms with the power of Swift — and as little code
as possible.</p>
						<p><span class="block-link
more">Learn about SwiftUI</span></p>
					</a>
				</div>
			</section>
		</div>

		<section class="section section-platforms padding-top">
			<div class="section-content">
				<div class="row">
					<div class="column large-centered large-6
medium-8 small-12">
						<h2 class="typography-section-
headline">Apple platforms</h2>
						<p>Develop apps that integrate
seamlessly with the latest advancements in Apple platforms.</p>
						<p><a href="/discover/"
class="more">Learn more</a></p>

						<ul class="chapternav-items">
							<li class="chapternav-item
chapternav-item-ios">
								<a class="chapternav-link"
href="/ios/">
```

```
                                                                <figure
class="chapternav-icon" data-hires-status="pending"></figure>
                                                                <span
class="chapternav-label">iOS</span>
                                                        </a>
                                                </li>
                                                <li class="chapternav-item
chapternav-item-ipados">
                                                        <a class="chapternav-link"
href="/ipados/">
                                                                <figure
class="chapternav-icon" data-hires-status="pending"></figure>
                                                                <span
class="chapternav-label">iPadOS</span>
                                                        </a>
                                                </li>
                                                <li class="chapternav-item
chapternav-item-macos">
                                                        <a class="chapternav-link"
href="/macos/">
                                                                <figure
class="chapternav-icon" data-hires-status="pending"></figure>
                                                                <span
class="chapternav-label">macOS</span>
                                                        </a>
                                                </li>
                                                <li class="chapternav-item
chapternav-item-tvos">
                                                        <a class="chapternav-link"
href="/tvos/">
                                                                <figure
class="chapternav-icon" data-hires-status="pending"></figure>
                                                                <span
class="chapternav-label">tvOS</span>
                                                        </a>
                                                </li>
                                                <li class="chapternav-item
chapternav-item-watchos">
                                                        <a class="chapternav-link"
href="/watchos/">
                                                                <figure
class="chapternav-icon" data-hires-status="pending"></figure>
                                                                <span
class="chapternav-label">watchOS</span>
                                                        </a>
                                                </li>
                                        </ul>
                                </div>
                        </div>
                </div>
        </section>

        <section class="section section-resources">
                <div class="section-content">
```

```
<div class="row">
	<div class="column large-6 medium-9 small-12">
		<h2 class="typography-section-headline">Technologies</h2>
		<p>Find tools and resources for creating apps and accessories for Mac, iPhone, iPad, <span class="nowrap">Apple Watch,</span> and <span class="nowrap">Apple TV.</span></p>
	</div>
</div>
<div class="row">
	<div class="column large-4 small-12">
		<figure class="icon-app-frameworks" data-hires-status="pending"></figure>
		<h4>Frameworks</h4>
		<ul class="link-theme-alt">
			<li><a href="/5g/">5G Networks</a></li>
			<li><a href="/accessories/">Accessories</a></li>
			<li><a href="/app-clips/">App Clips</a></li>
			<li><a href="/app-extensions/">App Extensions</a></li>
			<li><a href="/apple-pay/">Apple Pay</a></li>
			<li><a href="/bonjour/">Bonjour</a></li>
			<li><a href="/carplay/">CarPlay</a></li>
			<li><a href="/developer-id/">Developer ID</a></li>
			<li><a href="/education/">Education</a></li>
			<li><a href="/health-fitness/">Health and Fitness</a></li>
			<li><a href="/apple-home/">HomeKit</a></li>
			<li><a href="/ibeacon/">iBeacon</a></li>
			<li><a href="/icloud/">iCloud and CloudKit</a></li>
			<li><a href="/imessage/">iMessage</a></li>
			<li><a href="/in-app-purchase/">In-App Purchase</a></li>
			<li><a href="/localization/">Localization</a></li>
			<li><a href="/mac-catalyst/">Mac Catalyst</a></li>
			<li><a href="/machine-learning/">Machine Learning</a></li>
			<li><a href="/maps/">Maps</a></li>
```

```
                                                <li><a href="/nearby-
interaction/">Nearby Interaction</a></li>
                                                <li><a
href="/notifications/">Notifications</a></li>
                                                <li><a
href="/security/">Security</a></li>
                                                <li><a
href="/shareplay/">SharePlay</a></li>
                                                <li><a href="/sign-in-with-
apple/">Sign in with Apple</a></li>
                                                <li><a href="/siri/">Siri</a></li>
                                                <li><a
href="/storekit/">StoreKit</a></li>
                                                <li><a
href="/documentation/uikit">UIKit</a></li>
                                                <li><a
href="/wallet/">Wallet</a></li>
                                                <li><a
href="/widgets/">Widgets</a></li>
                                        </ul>
                                    </div>

                                    <div class="column large-4 small-12">
                                        <figure class="icon-media-and-web"
data-hires-status="pending"></figure>
                                        <h4>Media and web</h4>
                                        <ul class="link-theme-alt">
                                                <li><a
href="/airplay/">AirPlay</a></li>
                                                <li><a
href="/airprint/">AirPrint</a></li>
                                                <li><a href="/news-
publisher/">Apple News Format</a></li>
                                                <li><a
href="/audio/">Audio</a></li>
                                                <li><a href="/av-
foundation/">AVFoundation</a></li>
                                                <li><a href="/streaming/">HTTP
Live Streaming (HLS)</a></li>
                                                <li><a href="/live-photos/">Live
Photos</a></li>
                                                <li><a
href="/musickit/">MusicKit</a></li>
                                                <li><a
href="/passkeys/">Passkeys<span class="violator violator-inline violator-
reduced">New</span></a></li>
                                                <li><a
href="/safari/">Safari</a></li>
                                                <li><a
href="/safari/extensions/">Safari Extensions</a></li>
                                                <li><a
href="/shazamkit/">ShazamKit</a></li>
```

```
                                                <li><a
href="/weatherkit/">WeatherKit<span class="violator violator-inline violator-
reduced">New</span></a></li>
                                                <li><a href="https://webkit.org"
target="_blank">WebKit</a></li>
                                        </ul>

                                        <figure class="icon-graphics-and-games"
data-hires-status="pending"></figure>
                                        <h4>Graphics and games</h4>
                                        <ul class="link-theme-alt">
                                                <li><a
href="/accelerate/">Accelerate</a></li>
                                                <li><a href="/apple-
arcade/">Apple Arcade</a></li>
                                                <li><a href="/augmented-
reality/">Augmented Reality</a></li>
                                                <li><a
href="/games/">Games</a></li>
                                                <li><a href="/game-
center/">Game Center</a></li>
                                                <li><a
href="/metal/">Metal</a></li>
                                                <li><a
href="/scenekit/">SceneKit</a></li>
                                                <li><a
href="/spritekit/">SpriteKit</a></li>
                                        </ul>
                                </div>

                                <div class="column large-4 small-12">
                                        <figure class="icon-developer-tools"
data-hires-status="pending"></figure>
                                        <h4>Developer tools</h4>
                                        <ul class="link-theme-alt">
                                                <li><a
href="https://developer.apple.com/app-store-connect/">App Store
Connect</a></li>
                                                <li><a
href="https://icloud.developer.apple.com/">CloudKit Console</a></li>
                                                <li><a href="/download/all/?q=for
%20Xcode">Command Line Tools</a></li>
                                                <li><a
href="https://ml.developer.apple.com/">Core ML Model Deployment
Dashboard</a></li>
                                                <li><a
href="/machine-learning/create-ml/">Create ML</a></li>
                                                <li><a href="/bug-
reporting/">Feedback Assistant</a></li>
                                                <li><a
href="https://maps.developer.apple.com/">MapKit JS Dashboard</a></li>
                                                <li><a
href="/augmented-reality/reality-composer/">Reality Composer</a></li>
```

```
                                                <li><a
href="/augmented-reality/tools/">Reality Converter</a></li>
                                                <li><a href="/sf-symbols/">SF
Symbols</a></li>
                                                <li><a
href="/swift/">Swift</a></li>
                                                <li><a
href="/xcode/swiftui/">SwiftUI</a></li>
                                                <li><a href="/swift-
playgrounds/">Swift Playgrounds</a></li>
                                                <li><a
href="/testflight">TestFlight</a></li>
                                                <li><a
href="https://apps.apple.com/us/app/transporter/id1450874784?
mt=12">Transporter</a></li>
                                                <li><a
href="/xcode/">Xcode</a></li>
                                                <li><a href="/xcode-
cloud/">Xcode Cloud</a></li>
                                        </ul>
                                    </div>
                                </div>
                            </div>
                        </section>

                        <section class="section section-testflight">
                            <div class="section-content">
                                <div class="row">
                                    <div class="column large-8 medium-11 small-
12">
                                        <figure class="icon-testflight" data-hires-
status="pending"></figure>
                                        <h2 class="typography-section-
headline">Test your apps with TestFlight</h2>
                                        <p>TestFlight makes it easy to invite
users to test your apps and collect valuable feedback before releasing your apps
on the <span class="nowrap">App Store.</span> You can invite up to 10,000
testers using just their email address or by sharing a public link.</p>
                                        <p><a href="/testflight/"
class="more">Learn more about TestFlight</a></p>
                                    </div>
                                </div>
                            </div>
                        </section>

                    </main>

                    <link rel="stylesheet" property="stylesheet" href="/assets/styles/router-
strip.css?41172203193" type="text/css">
<aside class="section developer-router-links">
                    <div class="section-content">
                        <div class="row">
                            <div class="column large-3 medium-6 small-6">
                                <a href="/download/" class="block text-center">
```

```
                                        <figure class="router-icon router-icon-
download" data-hires-status="pending"></figure>
                                        <p><strong>SDKs and Betas</strong></p>
                                        <p class="typography-subbody">Download
SDKs and beta operating systems for all Apple platforms.</p>
                                        <p class="typography-subbody"><span
class="block-link more">View downloads</span></p>
                                </a>
                        </div>
                        <div class="column large-3 medium-6 small-6">
                                <a href="/documentation/" class="block text-center">
                                        <figure class="router-icon router-icon-
documentation" data-hires-status="pending"></figure>
                                        <p><strong>Documentation</strong></p>
                                        <p class="typography-subbody">Browse the
latest documentation including API reference, articles, and
sample code.</p>
                                        <p class="typography-subbody"><span
class="block-link more">Read documentation</span></p>
                                </a>
                        </div>
                        <div class="column large-3 medium-6 small-6">
                                <a href="/videos/" class="block text-center">
                                        <figure class="router-icon router-icon-videos"
data-hires-status="pending"></figure>
                                        <p><strong>Session Videos</strong></p>
                                        <p class="typography-subbody">See the latest
in Apple technologies presented at WWDC and other events.</p>
                                        <p class="typography-subbody"><span
class="block-link more">Watch videos</span></p>
                                </a>
                        </div>
                        <div class="column large-3 medium-6 small-6">
                                <a href="https://developer.apple.com/forums/"
class="block text-center">
                                        <figure class="router-icon router-icon-forums"
data-hires-status="pending"></figure>
                                        <p><strong>Discussion Forums</strong></p>
                                        <p class="typography-subbody">Ask questions
and discuss development topics with Apple engineers and
other developers.</p>
                                        <p class="typography-subbody"><span
class="block-link more">View forums</span></p>
                                </a>
                        </div>
                </div>
        </div>
</aside>


        <link rel="stylesheet" href="/assets/styles/footer.dist.css?
41172203193">
<footer id="footer" class="footer" role="contentinfo" aria-labelledby="footer-
label">
```

```
<div class="footer-content">
<h2 class="footer-label" id="footer-label">Developer Footer</h2>
<developer-breadcrumbs style="display: block;">



<nav class="footer-breadcrumbs" aria-label="Breadcrumbs"><a
href="https://www.apple.com/" class="home footer-breadcrumbs-home"><span
class="footer-breadcrumbs-home-icon" aria-hidden="true" data-hires-
status="pending">□</span><span class="footer-breadcrumbs-home-
label">Apple</span></a><div class="footer-breadcrumbs-path"><ol
class="footer-breadcrumbs-list"><li class="footer-breadcrumbs-item"><a
href="/">Developer</a></li><li
class="footer-breadcrumbs-item">Develop</li></ol></div></nav></developer
-breadcrumbs>
<nav class="footer-directory" aria-label="Apple Developer Directory"
role="navigation">
<!--googleoff: all-->
<div class="footer-directory-column">
<input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-platform">
<div class="footer-directory-column-section">
<label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-platform">
<h3 class="footer-directory-column-section-
title">Platforms</h3>
</label>
<a href="#footer-directory-column-section-state-platform"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
<a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
<ul class="footer-directory-column-section-list">
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ios/">iOS</a></li>
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ipados/">iPadOS</a></li>
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/macos/">macOS</a></li>
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tvos/">tvOS</a></li>
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/watchos/">watchOS</a></li>
</ul>
</div>

<input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-tools">
<div class="footer-directory-column-section">
<label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-tools">
```

```
                                <h3 class="footer-directory-column-section-
title">Tools</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-tools"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift/">Swift</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swiftui/">SwiftUI</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift-playgrounds/">Swift
Playgrounds</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/testflight/">TestFlight</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode/">Xcode</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode-cloud/">Xcode
Cloud</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/sf-symbols/">SF
Symbols</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-topics">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-topics">
                                <h3 class="footer-directory-column-section-
title">Topics &amp; Technologies</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-topics"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessibility/">Accessibility</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessories/">Accessories</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-extensions/">App
Extensions</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/">App
Store</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/audio/">Audio &amp;
Video</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/augmented-
reality/">Augmented Reality</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/business/">Business</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/">Design</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/distribute/">Distribution</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/education/">Education</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/fonts/">Fonts</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/games/">Games</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/health-fitness/">Health
&amp; Fitness</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/in-app-purchase/">In-App
Purchase</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/localization/">Localization</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/maps/">Maps &amp;
Location</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/machine-learning/">Machine
Learning</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/security/">Security</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/safari/">Safari &amp;
Web</a></li>
                        </ul>
                </div>
        </div>
```

```
<div class="footer-directory-column">
		<input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-resources">
		<div class="footer-directory-column-section">
			<label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-resources">
				<h3 class="footer-directory-column-section-
title">Resources</h3>
			</label>
			<a href="#footer-directory-column-section-state-resources"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
			<a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
			<ul class="footer-directory-column-section-list">
				<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/documentation/">Documentation</a></li>
				<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/curriculum/">Curriculum</a></li>
				<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/download/">Downloads</a></li>
				<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://developer.apple.com/forums/">Forums</a></li>
				<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/videos/">Videos</a></li>
			</ul>
		</div>

		<input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-support">
		<div class="footer-directory-column-section">
			<label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-support">
				<h3 class="footer-directory-column-section-
title">Support</h3>
			</label>
			<a href="#footer-directory-column-section-state-support"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
			<a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
			<ul class="footer-directory-column-section-list">
				<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/support/articles/">Support
Articles</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/contact/">Contact
Us</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/bug-reporting/">Bug
Reporting</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/system-status/">System
Status</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-account">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-account">
                                <h3 class="footer-directory-column-section-
title">Account</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-account"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/account/">Apple
Developer</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://appstoreconnect.apple.com/">App Store Connect</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/account/ios/certificate/">Certificates, IDs, &amp; Profiles</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://feedbackassistant.apple.com/">Feedback Assistant</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-programs">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-programs">
                                <h3 class="footer-directory-column-section-
title">Programs</h3>
                        </label>
```

```
                <a href="#footer-directory-column-section-state-programs" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-open"> <span class="footer-directory-column-section-anchor-label">Open Menu</span> </a>
                <a href="#" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-close"> <span class="footer-directory-column-section-anchor-label">Close Menu</span> </a>
                <ul class="footer-directory-column-section-list">
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/programs/">Apple Developer Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/programs/enterprise/">Apple Developer Enterprise Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/app-store/small-business-program/">App Store Small Business Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="https://mfi.apple.com/">MFi Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/programs/news-partner/">News Partner Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/programs/video-partner/">Video Partner Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/security-bounty/">Security Bounty Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/programs/security-research-device/">Security Research Device Program</a></li>
                </ul>
        </div>

        <input class="footer-directory-column-section-state" type="checkbox" id="footer-directory-column-section-state-events">
        <div class="footer-directory-column-section">
                <label class="footer-directory-column-section-label" for="footer-directory-column-section-state-events">
                        <h3 class="footer-directory-column-section-title">Events</h3>
                </label>
                <a href="#footer-directory-column-section-state-events" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-open"> <span class="footer-directory-column-section-anchor-label">Open Menu</span> </a>
                <a href="#" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-close"> <span class="footer-directory-column-section-anchor-label">Close Menu</span> </a>
                <ul class="footer-directory-column-section-list">
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/accelerator/">App Accelerators</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/app-store-
awards/">App Store Awards</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/awards/">Apple
Design Awards</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/experts/#academies">Apple Developer Academies</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/entrepreneur-
camp/">Entrepreneur Camp</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tech-talks/">Tech
Talks</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/wwdc/">WWDC</a></li>
                        </ul>
                </div>
        </div>
        <!--googleon: all-->
</nav>
      <section class="footer-mini" vocab="http://schema.org/"
typeof="Organization">
        <div class="footer-mini-news">
                <div class="copy">
                        To view the latest developer news, visit <a
href="/news/">News and Updates</a>.
                </div>
                <div class="content">
                        <div class="color-scheme-toggle" role="radiogroup"
tabindex="0" aria-label="Select a color scheme preference">

                                <label data-color-scheme-option="light">

                                        <input type="radio" value="light"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Light</div>

                                </label>

                                <label data-color-scheme-option="dark">

                                        <input type="radio" value="dark"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Dark</div>

                                </label>

                                <label data-color-scheme-option="auto">
```

```
                                        <input type="radio" value="auto"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Auto</div>

                                    </label>

                            </div>
                            <script async="" src="/assets/scripts/color-scheme-
toggle.js"></script>
                    </div>
            </div>
            <link rel="stylesheet" href="/assets/styles/language-dropdown.css?
41172203193">
            <div class="language-dropdown dropdown-container" data-
lang="complete">
                    <select class="dropdown" aria-label="Language
Dropdown"><option
value="https://developer.apple.com/develop/">English</option><option
value="https://developer.apple.com/cn/develop/">□□□□</option><option
value="https://developer.apple.com/jp/develop/">□□□</option><option
value="https://developer.apple.com/kr/develop/">□□□</option></select>
                    <span class="dropdown-icon icon icon-chevrondown" aria-
hidden="true"></span>
            </div>
            <script async="" src="/assets/scripts/lib/jquery/jquery.language-
dropdown.js?41172203193"></script>
            <div class="footer-mini-legal">
                    <div class="footer-mini-legal-copyright">Copyright ©  2022 <a
href="https://www.apple.com">Apple Inc.</a> All rights reserved.</div>
                    <div class="footer-mini-legal-links">
                            <a class="footer-mini-legal-link"
href="https://www.apple.com/legal/internet-services/terms/site.html">Terms of
Use</a>
                            <a class="footer-mini-legal-link"
href="https://www.apple.com/legal/privacy/en-ww/">Privacy Policy</a>
                            <a class="footer-mini-legal-link"
href="/support/terms/">Agreements and Guidelines</a>
                    </div>
            </div>
</section>
    </div>
</footer>


</body></html>

https://developer.apple.com/discover/<html
xmlns="https://www.w3.org/1999/xhtml" xml:lang="en" lang="en" class="js
touch svg no-ie8 progressive-image"><head>

            <meta charset="utf-8">
```

<meta name="Author" content="Apple Inc.">
<meta name="viewport" content="width=device-width, initial-scale=1, viewport-fit=cover">
<link rel="shortcut icon" href="/favicon.ico">
<link rel="icon" href="/favicon.ico">
<link rel="mask-icon" href="/apple-logo.svg" color="#333333">

<link rel="stylesheet" href="/assets/styles/global.dist.css?41172203193" type="text/css">
<link rel="stylesheet" href="/assets/styles/dark-mode.css?41172203193" type="text/css" media="" data-color-scheme="dark">
<link rel="stylesheet" href="/assets/styles/localization.css?41172203193" type="text/css">

<script src="/assets/scripts/lib/jquery/jquery-3.6.0.min.js?41172203193"></script>
<script src="/assets/scripts/settings.js?41172203193"></script>
<script src="/assets/scripts/language-locales.js?41172203193"></script>
<script src="/assets/scripts/DeveloperBreadcrumbs.js?41172203193"></script>

<script async="" src="/assets/scripts/lib/jquery/jquery.retinate.js?41172203193"></script>
<script async="" src="/assets/scripts/global.js?41172203193"></script>
<script async="" src="/assets/scripts/global-logout.js?41172203193"></script>

<link rel="stylesheet" href="https://www.apple.com/wss/fonts?family=SF+Pro&v=2" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?family=SF+Pro+Icons&v=1" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?family=SF+Mono&v=2" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?family=Apple+Icons&v=1" type="text/css">

<title>Discover - Apple Developer</title>
<meta name="omni_page" content="Discover - (English)">
<meta name="Description" content="Explore the capabilities and possibilities of the Apple ecosystem.">

<meta property="og:locale" content="en_US">
<meta property="og:site_name" content="Apple Developer">
<meta property="og:type" content="website">
<meta property="og:image" content="https://developer.apple.com/news/images/og/discover-og.jpg">
<meta property="og:title" content="Discover - Apple Developer">
<meta property="og:description" content="Explore the capabilities and possibilities of the Apple ecosystem.">
<meta property="og:url" content="https://developer.apple.com/discover/">

<meta name="twitter:card" content="summary_large_image">
<meta name="twitter:image" content="https://developer.apple.com/news/images/og/discover-og-twitter.jpg">
<meta name="twitter:title" content="Discover - Apple Developer">

```
	<meta name="twitter:description" content="Explore the capabilities and
possibilities of the Apple ecosystem.">
	<meta name="twitter:url"
content="https://developer.apple.com/discover/">

	<link rel="alternate" href="https://developer.apple.com/discover/"
hreflang="en">
	<link rel="alternate" href="https://developer.apple.com/cn/discover/"
hreflang="zh-CN">
	<link rel="alternate" href="https://developer.apple.com/jp/discover/"
hreflang="ja-JP">
	<link rel="alternate" href="https://developer.apple.com/kr/discover/"
hreflang="ko-KR">
	<link rel="canonical" href="https://developer.apple.com/discover/">

	<link rel="stylesheet" href="/discover/styles/discover.css"
type="text/css">
	<link rel="stylesheet" href="/assets/styles/router-strip.css"
type="text/css">
</head>
<body id="discover" class="nav-discover dmf" data-color-scheme="dark">

	<link rel="stylesheet" href="/assets/styles/globalnav.css?41172203193"
type="text/css">

<link rel="stylesheet" href="/assets/styles/suggest-lang.css?41172203193"
type="text/css">
<div id="suggest-lang" class="ribbon hide">
	<div class="ribbon-content-wrapper">
		<div class="ribbon-content row">
			<div class="column large-12 large-centered">
				<a id="suggest-closer" class="icon icon-after icon-
reset"></a>
				<p><a href="#" id="suggest-link" class="ribbon-link
more">View in English</a></p>
			</div>
		</div>
	</div>
</div>
<script src="/assets/scripts/suggest-lang.js?41172203193"></script>
<aside id="ac-gn-segmentbar" class="ac-gn-segmentbar" lang="en-US"
dir="ltr">
</aside>
<input type="checkbox" id="ac-gn-menustate" class="ac-gn-menustate">
<nav id="ac-globalnav" class="js touch no-windows" role="navigation" aria-
label="Global" data-hires="false" data-analytics-region="global nav" lang="en-
US" dir="ltr" data-www-domain="www.apple.com" data-store-locale="us" data-
store-root-path="/us" data-store-api="/[storefront]/shop/bag/status" data-
search-locale="en_US"
data-search-suggestions-api="/search-services/suggestions/" data-search-
defaultlinks-api="/search-services/suggestions/defaultlinks/" data-search-
suggestions-enabled="false">
	<div class="ac-gn-content">
		<ul class="ac-gn-header">
```

```
                <li class="ac-gn-item ac-gn-menuicon">
                        <label class="ac-gn-menuicon-label" for="ac-gn-
menustate" aria-hidden="true">
                                <span class="ac-gn-menuicon-bread ac-gn-
menuicon-bread-top">
                                        <span class="ac-gn-menuicon-bread-
crust ac-gn-menuicon-bread-crust-top"></span>
                                </span>
                                <span class="ac-gn-menuicon-bread ac-gn-
menuicon-bread-bottom">
                                        <span class="ac-gn-menuicon-bread-
crust ac-gn-menuicon-bread-crust-bottom"></span>
                                </span>
                        </label>
                        <a href="#ac-gn-menustate" role="button" class="ac-
gn-menuanchor ac-gn-menuanchor-open" id="ac-gn-menuanchor-open">
                                <span class="ac-gn-menuanchor-label">Global
Nav Open Menu</span>
                        </a>
                        <a href="#" role="button" class="ac-gn-menuanchor
ac-gn-menuanchor-close" id="ac-gn-menuanchor-close">
                                <span class="ac-gn-menuanchor-label">Global
Nav Close Menu</span>
                        </a>
                </li>
                <li class="ac-gn-item ac-gn-apple">
                        <a class="ac-gn-link ac-gn-link-apple-developer"
href="/" data-analytics-title="appledeveloper home" id="ac-gn-firstfocus-
small">
                                <span class="ac-gn-link-text">Apple
Developer</span>
                        </a>
                </li>
        </ul>
        <div class="ac-gn-search-placeholder-container" role="search">
                <div class="ac-gn-search ac-gn-search-small">
                        <a id="ac-gn-link-search-small" class="ac-gn-link"
href="/search/" data-analytics-title="search" data-analytics-click="search" data-
analytics-intrapage-link="" aria-label="Search" role="button" aria-
haspopup="true">
                                <div class="ac-gn-search-placeholder-bar">
                                        <div class="ac-gn-search-placeholder-
input">
                                                <div class="ac-gn-search-
placeholder-input-text" aria-hidden="true">
                                                        <div class="ac-gn-link-
search ac-gn-search-placeholder-input-icon"></div>
                                                        <span class="ac-gn-search-
placeholder">Search</span>
                                                </div>
                                        </div>
                                        <div class="ac-gn-searchview-close ac-
gn-searchview-close-small ac-gn-search-placeholder-searchview-close">
```

```
                                                <span class="ac-gn-searchview-
close-cancel" aria-hidden="true">Cancel</span>
                                                </div>
                                        </div>
                                </a>
                        </div>
                </div>
                <ul class="ac-gn-list">
                        <li class="ac-gn-item ac-gn-apple">
                                <a class="ac-gn-link ac-gn-link-apple-developer"
href="/" data-analytics-title="appledeveloper home" id="ac-gn-firstfocus">
                                        <span class="ac-gn-link-text">Apple
Developer</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-news">
                                <a class="ac-gn-link ac-gn-link-news" href="/news/"
data-analytics-title="news">
                                        <span class="ac-gn-link-text">News</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-discover">
                                <a class="ac-gn-link ac-gn-link-discover"
href="/discover/" data-analytics-title="discover">
                                        <span
class="ac-gn-link-text">Discover</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-design">
                                <a class="ac-gn-link ac-gn-link-design" href="/design/"
data-analytics-title="design">
                                        <span class="ac-gn-link-text">Design</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-develop">
                                <a class="ac-gn-link ac-gn-link-develop"
href="/develop/" data-analytics-title="develop">
                                        <span class="ac-gn-link-text">Develop</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-distribute">
                                <a class="ac-gn-link ac-gn-link-distribute"
href="/distribute/" data-analytics-title="distribute">
                                        <span
class="ac-gn-link-text">Distribute</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-dsupport">
                                <a class="ac-gn-link ac-gn-link-dsupport"
href="/support/" data-analytics-title="dsupport">
                                        <span class="ac-gn-link-text">Support</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-account">
```

```
                                <a class="ac-gn-link ac-gn-link-account"
href="/account/" data-analytics-title="account">
                                        <span class="ac-gn-link-text">Account</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-search"
role="search">
                                <a id="ac-gn-link-search" class="ac-gn-link ac-gn-link-
search" href="/search/" data-analytics-title="search" data-analytics-
click="search" data-analytics-intrapage-link="" aria-label="Search"
role="button" aria-haspopup="true"></a>
                        </li>
                </ul>
                <aside id="ac-gn-searchview" class="ac-gn-searchview"
role="search" data-analytics-region="search">
                        <div class="ac-gn-searchview-content">
                                <div class="ac-gn-searchview-bar">
                                        <div class="ac-gn-searchview-bar-wrapper">
                                                <form id="ac-gn-searchform" class="ac-
gn-searchform" action="/search/" method="get">
                                                        <div class="ac-gn-searchform-
wrapper">
                                                                <input id="ac-gn-
searchform-input" class="ac-gn-searchform-input" type="text" name="q" aria-
label="Search" placeholder="Search" autocorrect="off" autocapitalize="off"
autocomplete="off" spellcheck="false" role="combobox" aria-
autocomplete="list" aria-expanded="true" aria-owns="quicklinks suggestions">
                                                                <button id="ac-gn-
searchform-submit" class="ac-gn-searchform-submit" type="submit"
disabled="" aria-label="Submit Search"></button>
                                                                <button id="ac-gn-
searchform-reset" class="ac-gn-searchform-reset" type="reset" disabled=""
aria-label="Clear Search">
                                                                        <span
class="ac-gn-searchform-reset-background"></span>
                                                                </button>
                                                        </div>
                                                </form>
                                                <button id="ac-gn-searchview-close-
small" class="ac-gn-searchview-close ac-gn-searchview-close-small" aria-
label="Cancel Search">
                                                                <span class="ac-gn-
searchview-close-cancel" aria-hidden="true">
                                                                        Cancel
                                                                </span>
                                                        </button>
                                        </div>
                                </div>
                                <aside id="ac-gn-searchresults" class="ac-gn-
searchresults" data-string-quicklinks="Quick Links" data-string-
suggestions="Suggested Searches" data-string-noresults="">
                        <section class="ac-gn-searchresults-section ac-gn-searchresults-
section-defaultlinks">
                                <div class="ac-gn-searchresults-section-wrapper">
```

```
                                                    <div class="search-group-
checkbox hidden"><input id="group-input" type="checkbox" name="group-
filter" checked="">Only search within “<span
id="group-search-label"></span>”</div>
                        <h3 class="ac-gn-searchresults-header ac-gn-searchresults-
animated">Quick Links</h3>
                        <ul class="ac-gn-searchresults-list" id="defaultlinks"
role="listbox">
                        <li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a href="https://developer.apple.com/ios/" id="search-group-link-0"
class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">iOS
16</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a href="https://developer.apple.com/news/" id="search-group-link-
1" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">Latest
News</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a
href="https://developer.apple.com/documentation/storekit/appstore/
environment/3963900-xcode/" id="search-group-link-2" class="ac-gn-
searchresults-link ac-gn-searchresults-link-defaultlinks">xcode</a></li><li
class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a
href="https://developer.apple.com/xcode/whats-new/" id="search-group-link-3"
class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">What’s
included in Xcode</a></li><li class="ac-gn-searchresults-item ac-gn-
searchresults-animated"><a
href="https://developer.apple.com/videos/play/wwdc2022/110345/" id="search-
group-link-4" class="ac-gn-searchresults-link ac-gn-searchresults-link-
defaultlinks">What’s new in Endpoint Security</a></li></ul>
                        <span role="status" class="ac-gn-searchresults-count" aria-
live="polite">5 Quick Links</span>
                    </div>
                </section>
            </aside>
                        </div>
                        <button id="ac-gn-searchview-close" class="ac-gn-
searchview-close" aria-label="Cancel Search">
                                        <span class="ac-gn-searchview-close-
wrapper">
                                                <span class="ac-gn-searchview-close-
left"></span>
                                                <span class="ac-gn-searchview-close-
right"></span>
                                        </span>
                                    </button>
                </aside>
                        </div>
</nav>
<div class="ac-gn-blur"></div>
<div id="ac-gn-curtain" class="ac-gn-curtain"></div>
<div id="ac-gn-placeholder" class="ac-nav-placeholder"></div>
<script src="/assets/scripts/ac-globalnav.built.js?41172203193"></script><div
id="ac-gn-viewport-emitter"> </div>
<link rel="stylesheet" href="/assets/styles/search.css?41172203193">
<script src="/assets/scripts/search.js?41172203193"></script>
```

```
        <!-- metrics -->
<script>
   /* RSID: */
   var s_account="awdappledeveloper"
</script>
<script src="/assets/metrics/scripts/analytics.js?10202020"></script>
<script>
   s.pageName= AC && AC.Tracking && AC.Tracking.pageName();
   s.channel="www.en.developer"
   s.channel="www.en.developer";


   /************* DO NOT ALTER ANYTHING BELOW THIS LINE ! **************/
   var s_code=s.t();if(s_code)document.write(s_code)
</script>
<!-- /metrics -->

        <link rel="stylesheet" property="stylesheet"
href="/assets/styles/chapternav.css" type="text/css">
<nav id="chapternav" class="chapternav theme-dark">
        <div class="chapternav-wrapper">
                <ul class="chapternav-items">
                        <li class="chapternav-item chapternav-item-ios">
                                <a class="chapternav-link" href="/ios/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span class="chapternav-label">iOS</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-ipados">
                                <a class="chapternav-link" href="/ipados/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span
class="chapternav-label">iPadOS</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-macos">
                                <a class="chapternav-link" href="/macos/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span
class="chapternav-label">macOS</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-tvos">
                                <a class="chapternav-link" href="/tvos/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span class="chapternav-label">tvOS</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-watchos">
                                <a class="chapternav-link" href="/watchos/">
```

```
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span
class="chapternav-label">watchOS</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-app-store">
                                <a class="chapternav-link" href="/app-store/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span class="chapternav-label">App
Store</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-program">
                                <a class="chapternav-link" href="/programs/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span
class="chapternav-label">Program</span>
                                </a>
                        </li>
                </ul>
                <div class="chapternav-paddles">
                        <button class="chapternav-paddle chapternav-paddle-left"
aria-hidden="true" disabled=""></button>
                        <button class="chapternav-paddle chapternav-paddle-right"
aria-hidden="true" disabled=""></button>
                </div>
        </div>
</nav>
<link rel="stylesheet"
href="/assets/includes/platforms-chapter-nav/styles/platforms-chapter-nav.css">
<script src="/assets/scripts/chapternav.js"></script>


        <main id="main" class="main" role="main">
                <div class="ribbon ribbon-blue">
                        <div class="ribbon-drop-wrapper">
                                <div class="ribbon-content-wrapper">
                                        <div class="ribbon-content row">
                                                <div class="column large-centered large-
12 text-center">
                                                        <p>
                                                                <a href="/whats-new/"
class="ribbon-link">Find out what’s new for <span class="nowrap more">Apple
developers</span></a>
                                                        </p>
                                                </div>
                                        </div>
                                </div>
                        </div>
                </div>
```

```
<section class="section section-hero">
	<header class="bg-discover">
		<figure class="hero-discover" data-hires-status="pending"></figure>
	</header>
	<div class="section-content">
		<div class="row">
			<div class="column large-12">
				<div class="hero-copy">
					<h1 class="typography-hero-headline"><span class="eyebrow">Discover</span>Infinite Possibilities</h1>
					<p class="typography-intro large-6 medium-8 small-12">Developing for Apple platforms puts the cutting-edge technology of iOS, iPadOS, macOS, tvOS, and watchOS at your fingertips, giving you limitless ways to bring incredible apps to users around the world. These powerful platforms each offer unique capabilities and user experiences, yet integrate tightly to form a true ecosystem. Hardware, software, and services are designed from the ground up to work together so you can build intuitive, multi-faceted experiences that are genuinely seamless.</p>
				</div>
			</div>
		</div>
	</div>
</section>

<section class="section-design bg-grad-down" data-hires-status="pending">
	<section class="grid section section-develop padding-top padding-bottom">
		<div class="row padding-top">
			<div class="column large-8 large-centered small-12 gutter text-center">
				<h2 class="typography-section-headline"><span class="eyebrow">Learn, Build, and Innovate</span>Build apps. Build your future.</h2>
				<p class="intro">Whether you’re a first-time coder or an experienced developer looking to integrate the latest Apple technologies into your app, take advantage of free online resources to learn how to create apps with Swift and a variety of events and programs around the world.</p>
				<p><a href="/learn/" class="more">Get started</a></p>
			</div>
		</div>
	</section>
</section>

<div>
	<figure class="hero-develop" data-hires-status="pending" style="background-image: url(&quot;https://developer.apple.com/discover/images/develop_large_2x.jpg&quot;);"></figure>
</div>
```

<section class="grid section section-program padding-top padding-bottom">

<figure class="icon-program" data-hires-status="pending"></figure>
<h2 class="typography-section-headline">Apple Developer ProgramDeliver the next generation of apps.</h2>
As a member, you'll get access to the latest beta software so you can build and test for upcoming releases before they're in the hands of customers. You'll also be able to integrate advanced app capabilities and services into your apps, and distribute to over a billion customers on the App Store.
Learn about membership

</section>

<section class="grid section section-education section-two-up">

<h2 class="typography-section-headline">EducationApps for the classroom</h2>
Learn how to use the latest features on Apple platforms to build and optimize your apps for the classroom.
Learn about building apps for education

<!-- Tile image -->

</section>

<section class="grid section section-enterprise section-two-up">

<h2 class="typography-section-headline">BusinessCustom and in-house apps</h2>
Use the powerful capabilities of Apple platforms to build apps that integrate seamlessly with enterprise systems to transform how your business works.

```
                                        <p><a href="/business/">Learn about
creating apps <span class="nowrap more">for business</span></a></p>

                                    </div>
                                </div>
                                <div class="column large-6 small-12 gutter section-
enterprise-hero" data-hires-status="pending">
                                    <!-- Tile image -->
                                </div>
                            </div>
                        </section>

                    </main>

                    <aside class="section developer-router-links">
                        <div class="section-content">
                            <div class="row">
                                <div class="column large-3 medium-6 small-6">
                                    <a href="/news/" class="block text-center">
                                        <figure class="router-icon router-icon-
news" data-hires-status="pending"></figure>
                                        <p><strong>News and
Updates</strong></p>
                                        <p class="typography-subbody">See the
latest announcements and recommendations for Apple developers.</p>
                                        <p class="typography-subbody"><span
class="block-link more">View the latest</span></p>
                                    </a>
                                </div>
                                <div class="column large-3 medium-6 small-6">
                                    <a href="/documentation/" class="block text-
center">
                                        <figure class="router-icon router-icon-
documentation" data-hires-status="pending"></figure>

                    <p><strong>Documentation</strong></p>
                                        <p class="typography-subbody">Browse
the latest documentation including API reference, articles, and
sample code.</p>
                                        <p class="typography-subbody"><span
class="block-link more">Read API documentation</span></p>
                                    </a>
                                </div>
                                <div class="column large-3 medium-6 small-6">
                                    <a href="/videos/" class="block text-center">
                                        <figure class="router-icon router-icon-
videos" data-hires-status="pending"></figure>
                                        <p><strong>Session
Videos</strong></p>
                                        <p class="typography-subbody">See the
latest in Apple technologies presented at WWDC and other events.</p>
                                        <p class="typography-subbody"><span
class="block-link more">Watch videos</span></p>
                                    </a>
```

```
                                    </div>
                                    <div class="column large-3 medium-6 small-6">
                                            <a
href="https://developer.apple.com/download/" class="block text-center">
                                                    <figure class="router-icon router-icon-
download" data-hires-status="pending"></figure>
                                                    <p><strong>Software
Downloads</strong></p>
                                                    <p class="typography-subbody">Get the
latest releases of Xcode, iOS, iPadOS, macOS, tvOS, watchOS,
and more.</p>
                                                    <p class="typography-subbody"><span
class="block-link more">Download resources</span></p>
                                            </a>
                                    </div>
                            </div>
                    </div>
            </aside>


            <link rel="stylesheet" href="/assets/styles/footer.dist.css?
41172203193">
<footer id="footer" class="footer" role="contentinfo" aria-labelledby="footer-
label">
    <div class="footer-content">
        <h2 class="footer-label" id="footer-label">Developer Footer</h2>
            <developer-breadcrumbs style="display: block;">



            <nav class="footer-breadcrumbs" aria-label="Breadcrumbs"><a
href="https://www.apple.com/" class="home footer-breadcrumbs-home"><span
class="footer-breadcrumbs-home-icon" aria-hidden="true" data-hires-
status="pending">□</span><span class="footer-breadcrumbs-home-
label">Apple</span></a><div class="footer-breadcrumbs-path"><ol
class="footer-breadcrumbs-list"><li class="footer-breadcrumbs-item"><a
href="/">Developer</a></li><li
class="footer-breadcrumbs-item">Discover</li></ol></div></nav></develope
r-breadcrumbs>
                    <nav class="footer-directory" aria-label="Apple Developer Directory"
role="navigation">
            <!--googleoff: all-->
            <div class="footer-directory-column">
                    <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-platform">
                    <div class="footer-directory-column-section">
                            <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-platform">
                                    <h3 class="footer-directory-column-section-
title">Platforms</h3>
                            </label>
                            <a href="#footer-directory-column-section-state-platform"
class="footer-directory-column-section-anchor footer-directory-column-section-
```

anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu
<a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu
<ul class="footer-directory-column-section-list">
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ios/">iOS
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ipados/">iPadOS
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/macos/">macOS
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tvos/">tvOS
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/watchos/">watchOS

<input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-tools">

<label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-tools">
<h3 class="footer-directory-column-section-
title">Tools</h3>
</label>
<a href="#footer-directory-column-section-state-tools"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu
<a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu
<ul class="footer-directory-column-section-list">
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift/">Swift
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swiftui/">SwiftUI
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift-playgrounds/">Swift
Playgrounds
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/testflight/">TestFlight
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode/">Xcode
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode-cloud/">Xcode
Cloud
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/sf-symbols/">SF
Symbols

```
                </ul>
            </div>
        </div>

        <div class="footer-directory-column">
            <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-topics">
            <div class="footer-directory-column-section">
                <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-topics">
                    <h3 class="footer-directory-column-section-
title">Topics &amp; Technologies</h3>
                </label>
                <a href="#footer-directory-column-section-state-topics"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                <ul class="footer-directory-column-section-list">
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessibility/">Accessibility</a></li>
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessories/">Accessories</a></li>
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-extensions/">App
Extensions</a></li>
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/">App
Store</a></li>
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/audio/">Audio &amp;
Video</a></li>
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/augmented-
reality/">Augmented Reality</a></li>
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/business/">Business</a></li>
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/">Design</a></li>
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/distribute/">Distribution</a></li>
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/education/">Education</a></li>
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/fonts/">Fonts</a></li>
                    <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/games/">Games</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/health-fitness/">Health
&amp; Fitness</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/in-app-purchase/">In-App
Purchase</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/localization/">Localization</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/maps/">Maps &amp;
Location</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/machine-learning/">Machine
Learning</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/security/">Security</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/safari/">Safari &amp;
Web</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-resources">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-resources">
                                <h3 class="footer-directory-column-section-
title">Resources</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-resources"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/documentation/">Documentation</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/curriculum/">Curriculum</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/download/">Downloads</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://developer.apple.com/forums/">Forums</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/videos/">Videos</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-support">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-support">
                                <h3 class="footer-directory-column-section-
title">Support</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-support"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/support/articles/">Support
Articles</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/contact/">Contact
Us</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/bug-reporting/">Bug
Reporting</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/system-status/">System
Status</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-account">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-account">
                                <h3 class="footer-directory-column-section-
title">Account</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-account"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/account/">Apple
Developer</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://appstoreconnect.apple.com/">App Store Connect</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/account/ios/certificate/">Certificates, IDs, &amp; Profiles</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://feedbackassistant.apple.com/">Feedback Assistant</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-programs">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-programs">
                                <h3 class="footer-directory-column-section-
title">Programs</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-programs"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/">Apple Developer
Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/enterprise/">Apple
Developer Enterprise Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/small-business-
program/">App Store Small Business Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="https://mfi.apple.com/">MFi
Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/news-
partner/">News Partner Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/video-
partner/">Video Partner Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/security-bounty/">Security
Bounty Program</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/security-research-
device/">Security Research Device Program</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-events">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-events">
                                <h3 class="footer-directory-column-section-
title">Events</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-events"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/accelerator/">App
Accelerators</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/app-store-
awards/">App Store Awards</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/awards/">Apple
Design Awards</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/experts/#academies">Apple Developer Academies</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/entrepreneur-
camp/">Entrepreneur Camp</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tech-talks/">Tech
Talks</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/wwdc/">WWDC</a></li>
                        </ul>
                </div>
        </div>
        <!--googleon: all-->
</nav>
        <section class="footer-mini" vocab="http://schema.org/"
typeof="Organization">
        <div class="footer-mini-news">
                <div class="copy">
                        To view the latest developer news, visit <a
href="/news/">News and Updates</a>.
                </div>
```

```
                <div class="content">
                        <div class="color-scheme-toggle" role="radiogroup"
tabindex="0" aria-label="Select a color scheme preference">

                                <label data-color-scheme-option="light">

                                        <input type="radio" value="light"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Light</div>

                                </label>

                                <label data-color-scheme-option="dark">

                                        <input type="radio" value="dark"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Dark</div>

                                </label>

                                <label data-color-scheme-option="auto">

                                        <input type="radio" value="auto"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Auto</div>

                                </label>

                        </div>
                        <script async="" src="/assets/scripts/color-scheme-
toggle.js"></script>
                </div>
        </div>
        <link rel="stylesheet" href="/assets/styles/language-dropdown.css?
41172203193">
        <div class="language-dropdown dropdown-container" data-
lang="complete">
                <select class="dropdown" aria-label="Language
Dropdown"><option
value="https://developer.apple.com/discover/">English</option><option
value="https://developer.apple.com/cn/discover/">□□□□</option><option
value="https://developer.apple.com/jp/discover/">□□□</option><option
value="https://developer.apple.com/kr/discover/">□□□</option></select>
                <span class="dropdown-icon icon icon-chevrondown" aria-
hidden="true"></span>
        </div>
        <script async="" src="/assets/scripts/lib/jquery/jquery.language-
dropdown.js?41172203193"></script>
```

```
        <div class="footer-mini-legal">
                <div class="footer-mini-legal-copyright">Copyright ©  2022 <a
href="https://www.apple.com">Apple Inc.</a> All rights reserved.</div>
                <div class="footer-mini-legal-links">
                        <a class="footer-mini-legal-link"
href="https://www.apple.com/legal/internet-services/terms/site.html">Terms of
Use</a>
                        <a class="footer-mini-legal-link"
href="https://www.apple.com/legal/privacy/en-ww/">Privacy Policy</a>
                        <a class="footer-mini-legal-link"
href="/support/terms/">Agreements and Guidelines</a>
                </div>
        </div>
</section>
   </div>
</footer>

</body></html>

<html xmlns="https://www.w3.org/1999/xhtml" xml:lang="en"
lang="en"><head>
                <meta charset="utf-8">
<meta name="Author" content="Apple Inc.">
<meta name="viewport" content="width=device-width, initial-scale=1,
viewport-fit=cover">
<link rel="shortcut icon" href="/favicon.ico">
<link rel="icon" href="/favicon.ico">
<link rel="mask-icon" href="/apple-logo.svg" color="#333333">

<link rel="stylesheet" href="/assets/styles/global.dist.css?41172203193"
type="text/css">
<link rel="stylesheet" href="/assets/styles/dark-mode.css?41172203193"
type="text/css" media="" data-color-scheme="dark">
<link rel="stylesheet" href="/assets/styles/localization.css?41172203193"
type="text/css">

<script src="/assets/scripts/lib/jquery/jquery-3.6.0.min.js?41172203193"></
script>
<script src="/assets/scripts/settings.js?41172203193"></script>
<script src="/assets/scripts/language-locales.js?41172203193"></script>
<script src="/assets/scripts/DeveloperBreadcrumbs.js?41172203193"></script>

<script async="" src="/assets/scripts/lib/jquery/jquery.retinate.js?
41172203193"></script>
<script async="" src="/assets/scripts/global.js?41172203193"></script>
<script async="" src="/assets/scripts/global-logout.js?41172203193"></script>

                <link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Pro&amp;v=2" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Pro+Icons&amp;v=1" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Mono&amp;v=2" type="text/css">
```

<link rel="stylesheet" href="https://www.apple.com/wss/fonts?family=Apple+Icons&v=1" type="text/css">

<title>Design - Apple Developer</title>
<meta name="omni_page" content="Design - (English)">
<meta name="Description" content="Find documentation and resources for designing great apps for Apple platforms.">

<meta property="og:locale" content="en_US">
<meta property="og:site_name" content="Apple Developer">
<meta property="og:type" content="website">
<meta property="og:image" content="https://developer.apple.com/news/images/og/design-og.jpg">
<meta property="og:title" content="Design - Apple Developer">
<meta property="og:description" content="Find documentation and resources for designing great apps for Apple platforms.">
<meta property="og:url" content="https://developer.apple.com/design/">

<meta name="twitter:card" content="summary_large_image">
<meta name="twitter:image" content="https://developer.apple.com/news/images/og/design-og-twitter.jpg">
<meta name="twitter:title" content="Design - Apple Developer">
<meta name="twitter:description" content="Find documentation and resources for designing great apps for Apple platforms.">
<meta name="twitter:url" content="https://developer.apple.com/design/">

<link rel="alternate" href="https://developer.apple.com/design/" hreflang="en">
<link rel="alternate" href="https://developer.apple.com/cn/design/" hreflang="zh-CN">
<link rel="alternate" href="https://developer.apple.com/jp/design/" hreflang="ja-JP">
<link rel="alternate" href="https://developer.apple.com/kr/design/" hreflang="ko-KR">
<link rel="canonical" href="https://developer.apple.com/design/">

<link rel="stylesheet" href="/design/styles/design-alt.css?Friday, 15-Jul-2022 23:08:05 GMT1" type="text/css">
</head>

<body class="nav-design dmf" data-color-scheme="dark">
<link rel="stylesheet" href="/assets/styles/globalnav.css?41172203193" type="text/css">

<link rel="stylesheet" href="/assets/styles/suggest-lang.css?41172203193" type="text/css">


```
                                <p><a href="#" id="suggest-link" class="ribbon-link
more">View in English</a></p>
                        </div>
                </div>
        </div>
</div>
<script src="/assets/scripts/suggest-lang.js?41172203193"></script>
<aside id="ac-gn-segmentbar" class="ac-gn-segmentbar" lang="en-US"
dir="ltr">
</aside>
<input type="checkbox" id="ac-gn-menustate" class="ac-gn-menustate">
<nav id="ac-globalnav" class="js touch no-windows" role="navigation" aria-
label="Global" data-hires="false" data-analytics-region="global nav" lang="en-
US" dir="ltr" data-www-domain="www.apple.com" data-store-locale="us" data-
store-root-path="/us" data-store-api="/[storefront]/shop/bag/status" data-
search-locale="en_US"
data-search-suggestions-api="/search-services/suggestions/" data-search-
defaultlinks-api="/search-services/suggestions/defaultlinks/" data-search-
suggestions-enabled="false">
        <div class="ac-gn-content">
                <ul class="ac-gn-header">
                        <li class="ac-gn-item ac-gn-menuicon">
                                <label class="ac-gn-menuicon-label" for="ac-gn-
menustate" aria-hidden="true">
                                        <span class="ac-gn-menuicon-bread ac-gn-
menuicon-bread-top">
                                                <span class="ac-gn-menuicon-bread-
crust ac-gn-menuicon-bread-crust-top"></span>
                                        </span>
                                        <span class="ac-gn-menuicon-bread ac-gn-
menuicon-bread-bottom">
                                                <span class="ac-gn-menuicon-bread-
crust ac-gn-menuicon-bread-crust-bottom"></span>
                                        </span>
                                </label>
                                <a href="#ac-gn-menustate" role="button" class="ac-
gn-menuanchor ac-gn-menuanchor-open" id="ac-gn-menuanchor-open">
                                        <span class="ac-gn-menuanchor-label">Global
Nav Open Menu</span>
                                </a>
                                <a href="#" role="button" class="ac-gn-menuanchor
ac-gn-menuanchor-close" id="ac-gn-menuanchor-close">
                                        <span class="ac-gn-menuanchor-label">Global
Nav Close Menu</span>
                                </a>
                        </li>
                        <li class="ac-gn-item ac-gn-apple">
                                <a class="ac-gn-link ac-gn-link-apple-developer"
href="/" data-analytics-title="appledeveloper home" id="ac-gn-firstfocus-
small">
                                        <span class="ac-gn-link-text">Apple
Developer</span>
                                </a>
                        </li>
```

```
</ul>
<div class="ac-gn-search-placeholder-container" role="search">
	<div class="ac-gn-search ac-gn-search-small">
		<a id="ac-gn-link-search-small" class="ac-gn-link" 
href="/search/" data-analytics-title="search" data-analytics-click="search" data-
analytics-intrapage-link="" aria-label="Search" role="button" aria-
haspopup="true">
			<div class="ac-gn-search-placeholder-bar">
				<div class="ac-gn-search-placeholder-
input">
					<div class="ac-gn-search-
placeholder-input-text" aria-hidden="true">
						<div class="ac-gn-link-
search ac-gn-search-placeholder-input-icon"></div>
						<span class="ac-gn-search-
placeholder">Search</span>
					</div>
				</div>
				<div class="ac-gn-searchview-close ac-
gn-searchview-close-small ac-gn-search-placeholder-searchview-close">
					<span class="ac-gn-searchview-
close-cancel" aria-hidden="true">Cancel</span>
				</div>
			</div>
		</a>
	</div>
</div>
<ul class="ac-gn-list">
	<li class="ac-gn-item ac-gn-apple">
		<a class="ac-gn-link ac-gn-link-apple-developer" 
href="/" data-analytics-title="appledeveloper home" id="ac-gn-firstfocus">
			<span class="ac-gn-link-text">Apple 
Developer</span>
			</a>
	</li>
	<li class="ac-gn-item ac-gn-item-menu ac-gn-news">
		<a class="ac-gn-link ac-gn-link-news" href="/news/" 
data-analytics-title="news">
			<span class="ac-gn-link-text">News</span>
			</a>
	</li>
	<li class="ac-gn-item ac-gn-item-menu ac-gn-discover">
		<a class="ac-gn-link ac-gn-link-discover" 
href="/discover/" data-analytics-title="discover">
			<span 
class="ac-gn-link-text">Discover</span>
			</a>
	</li>
	<li class="ac-gn-item ac-gn-item-menu ac-gn-design">
		<a class="ac-gn-link ac-gn-link-design" href="/design/" 
data-analytics-title="design">
			<span class="ac-gn-link-text">Design</span>
			</a>
	</li>
```

```
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-develop">
                                <a class="ac-gn-link ac-gn-link-develop"
href="/develop/" data-analytics-title="develop">
                                        <span class="ac-gn-link-text">Develop</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-distribute">
                                <a class="ac-gn-link ac-gn-link-distribute"
href="/distribute/" data-analytics-title="distribute">
                                        <span
class="ac-gn-link-text">Distribute</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-dsupport">
                                <a class="ac-gn-link ac-gn-link-dsupport"
href="/support/" data-analytics-title="dsupport">
                                        <span class="ac-gn-link-text">Support</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-account">
                                <a class="ac-gn-link ac-gn-link-account"
href="/account/" data-analytics-title="account">
                                        <span class="ac-gn-link-text">Account</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-search"
role="search">
                                <a id="ac-gn-link-search" class="ac-gn-link ac-gn-link-
search" href="/search/" data-analytics-title="search" data-analytics-
click="search" data-analytics-intrapage-link="" aria-label="Search"
role="button" aria-haspopup="true"></a>
                        </li>
                </ul>
                <aside id="ac-gn-searchview" class="ac-gn-searchview"
role="search" data-analytics-region="search">
                        <div class="ac-gn-searchview-content">
                                <div class="ac-gn-searchview-bar">
                                        <div class="ac-gn-searchview-bar-wrapper">
                                                <form id="ac-gn-searchform" class="ac-
gn-searchform" action="/search/" method="get">
                                                        <div class="ac-gn-searchform-
wrapper">
                                                                <input id="ac-gn-
searchform-input" class="ac-gn-searchform-input" type="text" name="q" aria-
label="Search" placeholder="Search" autocorrect="off" autocapitalize="off"
autocomplete="off" spellcheck="false" role="combobox" aria-
autocomplete="list" aria-expanded="true" aria-owns="quicklinks suggestions">
                                                                <button id="ac-gn-
searchform-submit" class="ac-gn-searchform-submit" type="submit"
disabled="" aria-label="Submit Search"></button>
                                                                <button id="ac-gn-
searchform-reset" class="ac-gn-searchform-reset" type="reset" disabled=""
aria-label="Clear Search">
```

```
                                                                                <span
class="ac-gn-searchform-reset-background"></span>
                                                                                </button>
                                                                        </div>
                                                                </form>
                                                                <button id="ac-gn-searchview-close-
small" class="ac-gn-searchview-close ac-gn-searchview-close-small" aria-
label="Cancel Search">
                                                                        <span class="ac-gn-
searchview-close-cancel" aligned="true">
                                                                                Cancel
                                                                        </span>
                                                                </button>
                                                        </div>
                                                </div>
                                                <aside id="ac-gn-searchresults" class="ac-gn-
searchresults" data-string-quicklinks="Quick Links" data-string-
suggestions="Suggested Searches" data-string-noresults="">
                                        <section class="ac-gn-searchresults-section ac-gn-searchresults-
section-defaultlinks">
                                                <div class="ac-gn-searchresults-section-wrapper">
                                                                        <div class="search-group-
checkbox hidden"><input id="group-input" type="checkbox" name="group-
filter" checked="">Only search within “<span
id="group-search-label"></span>”</div>
                                                                <h3 class="ac-gn-searchresults-header ac-gn-searchresults-
animated">Quick Links</h3>
                                                                <ul class="ac-gn-searchresults-list" id="defaultlinks"
role="listbox">
                                                                <li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a href="https://developer.apple.com/ios/" id="search-group-link-0"
class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">iOS
16</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a href="https://developer.apple.com/news/" id="search-group-link-
1" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">Latest
News</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a
href="https://developer.apple.com/documentation/storekit/appstore/
environment/3963900-xcode/" id="search-group-link-2" class="ac-gn-
searchresults-link ac-gn-searchresults-link-defaultlinks">xcode</a></li><li
class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a
href="https://developer.apple.com/xcode/whats-new/" id="search-group-link-3"
class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">What’s
included in Xcode</a></li><li class="ac-gn-searchresults-item ac-gn-
searchresults-animated"><a
href="https://developer.apple.com/videos/play/wwdc2022/110345/" id="search-
group-link-4" class="ac-gn-searchresults-link ac-gn-searchresults-link-
defaultlinks">What’s new in Endpoint Security</a></li></ul>
                                                                <span role="status" class="ac-gn-searchresults-count" aria-
live="polite">5 Quick Links</span>
                                                        </div>
                                                </section>
                                        </aside>
                                                        </div>
```

```
                        <button id="ac-gn-searchview-close" class="ac-gn-
searchview-close" aria-label="Cancel Search">
                                    <span class="ac-gn-searchview-close-
wrapper">
                                            <span class="ac-gn-searchview-close-
left"></span>
                                            <span class="ac-gn-searchview-close-
right"></span>
                                    </span>
                                </button>
                </aside>
                        </div>
</nav>
<div class="ac-gn-blur"></div>
<div id="ac-gn-curtain" class="ac-gn-curtain"></div>
<div id="ac-gn-placeholder" class="ac-nav-placeholder"></div>
<script src="/assets/scripts/ac-globalnav.built.js?41172203193"></script><div
id="ac-gn-viewport-emitter"> </div>
<link rel="stylesheet" href="/assets/styles/search.css?41172203193">
<script src="/assets/scripts/search.js?41172203193"></script>

        <!-- metrics -->
<script>
   /* RSID: */
   var s_account="awdappledeveloper"
</script>
<script src="/assets/metrics/scripts/analytics.js?10202020"></script>
<script>
   s.pageName= AC && AC.Tracking && AC.Tracking.pageName();
   s.channel="www.en.developer"
   s.channel="www.en.developer";


   /************* DO NOT ALTER ANYTHING BELOW THIS LINE ! **************/
   var s_code=s.t();if(s_code)document.write(s_code)
</script>
<!-- /metrics -->
        <link rel="stylesheet" property="stylesheet"
href="/assets/styles/localnav.css" type="text/css">
<input type="checkbox" id="localnav-menustate" class="localnav-menustate">
<div id="localnav-sticky-placeholder" class="css-sticky"></div><nav
id="localnav" class="localnav localnav-scrim css-sticky" data-sticky=""
role="navigation">
   <div class="localnav-wrapper">
      <div class="localnav-background"></div>
      <div class="localnav-content">
         <h2 class="localnav-title">
            <a class="ac-ln-title-logo" href="/design/" data-analytics-
title="product index">Design</a>
         </h2>

         <div class="localnav-menu">
            <a href="#localnav-menustate" class="localnav-menucta-anchor
localnav-menucta-anchor-open" id="localnav-menustate-open">
```

```
                <span class="localnav-menucta-anchor-label">Open Menu</span>
            </a>
            <a href="#" class="localnav-menucta-anchor localnav-menucta-
anchor-close" id="localnav-menustate-close">
                <span class="localnav-menucta-anchor-label">Close Menu</span>
            </a>
            <div class="localnav-menu-tray">
                      <ul class="localnav-menu-items">
                <li class="localnav-menu-item">
                    <a href="/design/" class="localnav-menu-link current" aria-
disabled="true">Overview</a>
                </li>
                <li class="localnav-menu-item">
                    <a href="/design/whats-new/" class="localnav-menu-
link">What's New</a>
                </li>
                <li class="localnav-menu-item">
                    <a
href="/design/human-interface-guidelines/guidelines/overview" class="localnav-
menu-link">Guidelines</a>
                </li>
                <li class="localnav-menu-item">
                    <a href="/design/awards/" class="localnav-menu-link">Design
Awards</a>
                </li>
                <li class="localnav-menu-item">
                    <a href="/videos/design/" class="localnav-menu-
link">Videos</a>
                </li>
                <li class="localnav-menu-item">
                    <a href="/design/resources/" class="localnav-menu-
link">Resources</a>
                </li>
                </ul>
            </div>
            <div class="localnav-actions">
                <div class="localnav-action localnav-action-menucta" aria-
hidden="true">
                <label for="localnav-menustate" class="localnav-menucta">
                    <span class="localnav-menucta-chevron"></span>
                </label>
                </div>
            </div>

        </div>
    </div>
  </div>
</nav>
<label id="localnav-curtain" for="localnav-menustate"></label>
<script src="/assets/scripts/ac-localnav.built.js"></script><div id="localnav-
viewport-emitter" data-viewport-emitter-dispatch="" data-viewport-emitter-
state="{&quot;viewport&quot;:&quot;small&quot;,&quot;orientation&quot;:&quo
t;portrait&quot;,&quot;retina&quot;:true}"></div>
<script type="text/javascript" src="/assets/scripts/localnav.js"></script>
```

```
<main id="main" class="main" role="main">

<section id="hello-section" class="section section-hero" style="background-color: rgb(153, 122, 0);">
<figure class="hello-hero" id="hello-hero" data-hires-status="pending" style="background-image: url(&quot;/design/images/hello/design-hero-yellow-dark_2x.png&quot;);"></figure>
<div class="section-content">
<div class="row">
<div class="column large-8 medium-11 small-12 large-centered text-center">
<p class="hero-text">Learn how to design great apps and games that integrate seamlessly with Apple platforms.</p>
</div>
</div>
</div>
<div class="section-content">
<div class="row">
<div class="column large-9 medium-11 small-12 large-centered text-center">
<h1 class="typography-hero-headline">What’s new</h1>
<p class="typography-intro">Explore inspirational designs, videos, articles and resources. Keep informed with the latest additions and updates to design guidance.</p>
<p class="typography-intro">
<a class="more" href="/design/whats-new/">View Updates</a>
</p>
</div>
</div>
</div>
</section>
<script src="/design/scripts/hello-hero.js?Tuesday, 12-Jul-2022 17:06:18 GMT"></script>

<section class="section section-meet">
<div class="section-content">
<div class="row">
<div class="column large-10 medium-11 small-12 large-centered text-center">
<h1 class="typography-hero-headline">Human Interface Guidelines</h1>
<p class="typography-intro">Meet the new Human Interface Guidelines. Get in-depth information and Ul resources for designing great apps that integrate seamlessly with Apple platforms. Human Interface Guidelines provides components and tools to help you work more efficiently, and to make your applications more cohesive.</p>
<p class="typography-intro"><a href="/design/human-interface-guidelines/guidelines/overview" class="nowrap more">Meet the Human Interface Guidelines</a></p>
```

```
                        </div>
                    </div>
                </div>
            </section>

            <section class="section section-videos">
                <div class="section-content">
                    <div class="row">
                        <div class="column large-10 medium-11 small-
12 large-centered text-center">
                            <h1 class="typography-hero-
headline">Design videos</h1>
                        </div>
                    </div>
                </div>
                <div class="row justify-content-center">
                    <div class="large-container-grid">
                        <div class="grid-3x">
                            <a class="card card-small"
href="/videos/play/wwdc2022/10009/">
                                <figure class="card-image video-
card-1" data-hires-status="pending">
                                    <div class="design-
timestamp">
                                        <p>18:08</p>
                                    </div>
                                </figure>
                                <div class="card-info">
                                    <div>
                                        <p class="card-
detial">WWDC22 - iPadOS</p>
                                        <h5 class="card-
title">What’s new in iPad app design</h5>
                                        <p class="card-
desc">Discover the latest updates in iPad app design. We’ll take you through
improvements to search, navigation bars, edit menus, multi-selection, and
more.</p>
                                    </div>
                                    <p class="card-link"><span
class="icon icon-before icon-playcircle link">Watch Now</span></p>
                                </div>
                            </a>
                            <a class="card card-small"
href="/videos/play/wwdc2022/10037/">
                                <figure class="card-image video-
card-2" data-hires-status="pending">
                                    <div class="design-
timestamp">
                                        <p>23:29</p>
                                    </div>
                                </figure>
                                <div class="card-info">
                                    <div>
```

```
                                                                <p class="card-
detial">WWDC22 - All platforms</p>
                                                                <h5 class="card-
title">Writing for interfaces</h5>
                                                                <p class="card-
desc">Learn how you can design through the lens of language and help people
get the most from your app.</p>
                                                        </div>
                                                        <p class="card-link"><span
class="icon icon-before icon-playcircle link">Watch Now</span></p>
                                                </div>
                                        </a>
                                        <a class="card card-small"
href="/videos/play/wwdc2022/110342/">
                                                <figure class="card-image video-
card-3" data-hires-status="pending">
                                                        <div class="design-
timestamp">
                                                                <p>15:43</p>
                                                        </div>
                                                </figure>
                                                <div class="card-info">
                                                        <div>
                                                                <p class="card-
detial">WWDC22 - iOS, iPadOS, macOS, watchOS</p>
                                                                <h5 class="card-
title">Design app experiences with charts</h5>
                                                                <p class="card-
desc">Learn how you can enhance your app with charts to communicate data
with more clarity and appeal.</p>
                                                        </div>
                                                        <p class="card-link"><span
class="icon icon-before icon-playcircle link">Watch Now</span></p>
                                                </div>
                                        </a>
                                </div>
                        </div>
                </div>
        </section>

        <section class="section section-articles">
                <div class="section-content">
                        <div class="row">
                                <div class="column large-10 medium-11 small-
12 large-centered text-center">
                                        <h1 class="typography-hero-
headline">Design articles</h1>
                                </div>
                        </div>
                </div>
                <div class="row justify-content-center">
                        <div class="large-container-grid">
                                <div class="grid-3x">
```

```
                                        <a class="card card-small" href="/news/?
id=9t542fct">
                                                <figure class="card-image article-
card-1" data-hires-status="pending"></figure>
                                                <div class="card-info">
                                                        <p class="card-
detial">News - June 7, 2022</p>
                                                        <h5 class="card-
title">Apple Design Award winners announced</h5>
                                                        <p class="card-link
link"><span class="icon-hig-article"
data-hires-status="pending">Read</span></p>
                                                </div>
                                        </a>
                                        <a class="card card-small" href="/news/?
id=v8a3aetj">
                                                <figure class="card-image article-
card-2" data-hires-status="pending"></figure>
                                                <div class="card-info">
                                                        <p class="card-
detial">Articles</p>
                                                        <h5 class="card-title">Meet
the new Human Interface Guidelines</h5>
                                                        <p class="card-link
link"><span class="icon-hig-article"
data-hires-status="pending">Read</span></p>
                                                </div>
                                        </a>
                                        <a class="card card-small" href="/news/?
id=3sgp4ps7">
                                                <figure class="card-image article-
card-3" data-hires-status="pending"></figure>
                                                <div class="card-info">
                                                        <p class="card-
detial">Article</p>
                                                        <h5 class="card-
title">Challenge: Pixel perfect design</h5>
                                                        <p class="card-link
link"><span class="icon-hig-article"
data-hires-status="pending">Read</span></p>
                                                </div>
                                        </a>
                                </div>
                        </div>
                </div>
        </section>

        <section class="section section-articles">
                <div class="row justify-content-center">
                        <a class="large-container-grid"
href="/design/resources/">
                                <div class="card no-pointer">
                                        <div class="column large-12 medium-12
small-12 large-centered text-center resources-card">
```

```
                                                <h1 class="typography-hero-
headline">Apple Design Resources</h1>
                                                <p class="typography-
intro">Design apps quickly and accurately by using Sketch, Photoshop, and XD
templates, guides, and other resources.</p>
                                                <p class="typography-intro nowrap
more link">Go to Apple Design Resources</p>
                                            </div>
                                            <img class="dark-mode-image row"
src="https://developer.apple.com/design/images/hello/apple-design-resources-
dark_2x.jpg" width="100%" alt="" data-hires-status="pending">
                                        </div>
                                    </a>
                                </div>
                            </section>

                            <section class="section section-articles">
                                <div class="row justify-content-center">
                                    <a class="large-container-grid"
href="/design/awards/">
                                        <div class="card no-pointer">
                                            <picture class="row">
                                                <source media="(max-width:
735px)" srcset="/design/images/hello/apple-design-awards-22-small_2x.jpg">
                                                <source media="(max-width:
1065px)" srcset="/design/images/hello/apple-design-awards-22-
medium_2x.jpg">
                                                <img
src="/design/images/hello/apple-design-awards-22-large_2x.jpg" width="100%"
class="" alt="" data-hires-status="pending">
                                            </picture>
                                            <div class="column large-8 medium-9
small-12 large-centered text-center ada-card">
                                                <h1 class="typography-hero-
headline">Apple Design Awards</h1>
                                                <p class="typography-intro">The
Apple Design Awards honor excellence in innovation, ingenuity, and technical
achievement in app and game design.</p>
                                                <p class="typography-intro nowrap
link more">View the 2022 winners</p>
                                            </div>
                                        </div>
                                    </a>
                                </div>
                            </section>
                        </main>
                        <script
src="/design/human-interface-guidelines/scripts/darkModeImages.js"></script>
                        <link rel="stylesheet" href="/assets/styles/footer.dist.css?
41172203193">
<footer id="footer" class="footer" role="contentinfo" aria-labelledby="footer-
label">
    <div class="footer-content">
        <h2 class="footer-label" id="footer-label">Developer Footer</h2>
```

```
        <developer-breadcrumbs style="display: block;">

        <nav class="footer-breadcrumbs" aria-label="Breadcrumbs"><a
href="https://www.apple.com/" class="home footer-breadcrumbs-home"><span
class="footer-breadcrumbs-home-icon" aria-hidden="true" data-hires-
status="pending">□</span><span class="footer-breadcrumbs-home-
label">Apple</span></a><div class="footer-breadcrumbs-path"><ol
class="footer-breadcrumbs-list"><li class="footer-breadcrumbs-item"><a
href="/">Developer</a></li><li
class="footer-breadcrumbs-item">Design</li></ol></div></nav></developer-
breadcrumbs>
                <nav class="footer-directory" aria-label="Apple Developer Directory"
role="navigation">
        <!--googleoff: all-->
        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-platform">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-platform">
                                <h3 class="footer-directory-column-section-
title">Platforms</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-platform"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ios/">iOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ipados/">iPadOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/macos/">macOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tvos/">tvOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/watchos/">watchOS</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-tools">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-tools">
                                <h3 class="footer-directory-column-section-
title">Tools</h3>
                        </label>
```

```
                        <a href="#footer-directory-column-section-state-tools"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift/">Swift</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swiftui/">SwiftUI</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift-playgrounds/">Swift
Playgrounds</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/testflight/">TestFlight</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode/">Xcode</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode-cloud/">Xcode
Cloud</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/sf-symbols/">SF
Symbols</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-topics">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-topics">
                                <h3 class="footer-directory-column-section-
title">Topics &amp; Technologies</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-topics"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessibility/">Accessibility</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessories/">Accessories</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-extensions/">App
Extensions</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/">App
Store</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/audio/">Audio &amp;
Video</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/augmented-
reality/">Augmented Reality</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/business/">Business</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/">Design</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/distribute/">Distribution</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/education/">Education</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/fonts/">Fonts</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/games/">Games</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/health-fitness/">Health
&amp; Fitness</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/in-app-purchase/">In-App
Purchase</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/localization/">Localization</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/maps/">Maps &amp;
Location</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/machine-learning/">Machine
Learning</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/security/">Security</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/safari/">Safari &amp;
Web</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
```

```
<input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-resources">
<div class="footer-directory-column-section">
<label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-resources">
<h3 class="footer-directory-column-section-
title">Resources</h3>
</label>
<a href="#footer-directory-column-section-state-resources"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
<a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
<ul class="footer-directory-column-section-list">
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/documentation/">Documentation</a></li>
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/curriculum/">Curriculum</a></li>
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/download/">Downloads</a></li>
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://developer.apple.com/forums/">Forums</a></li>
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/videos/">Videos</a></li>
</ul>
</div>

<input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-support">
<div class="footer-directory-column-section">
<label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-support">
<h3 class="footer-directory-column-section-
title">Support</h3>
</label>
<a href="#footer-directory-column-section-state-support"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
<a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
<ul class="footer-directory-column-section-list">
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/support/articles/">Support
Articles</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/contact/">Contact
Us</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/bug-reporting/">Bug
Reporting</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/system-status/">System
Status</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-account">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-account">
                                <h3 class="footer-directory-column-section-
title">Account</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-account"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/account/">Apple
Developer</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://appstoreconnect.apple.com/">App Store Connect</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/account/ios/certificate/">Certificates, IDs, &amp; Profiles</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://feedbackassistant.apple.com/">Feedback Assistant</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-programs">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-programs">
                                <h3 class="footer-directory-column-section-
title">Programs</h3>
                        </label>
```

```
                <a href="#footer-directory-column-section-state-programs" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-open"> <span class="footer-directory-column-section-anchor-label">Open Menu</span> </a>
                <a href="#" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-close"> <span class="footer-directory-column-section-anchor-label">Close Menu</span> </a>
                <ul class="footer-directory-column-section-list">
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/programs/">Apple Developer Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/programs/enterprise/">Apple Developer Enterprise Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/app-store/small-business-program/">App Store Small Business Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="https://mfi.apple.com/">MFi Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/programs/news-partner/">News Partner Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/programs/video-partner/">Video Partner Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/security-bounty/">Security Bounty Program</a></li>
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/programs/security-research-device/">Security Research Device Program</a></li>
                </ul>
        </div>

        <input class="footer-directory-column-section-state" type="checkbox" id="footer-directory-column-section-state-events">
        <div class="footer-directory-column-section">
                <label class="footer-directory-column-section-label" for="footer-directory-column-section-state-events">
                        <h3 class="footer-directory-column-section-title">Events</h3>
                </label>
                <a href="#footer-directory-column-section-state-events" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-open"> <span class="footer-directory-column-section-anchor-label">Open Menu</span> </a>
                <a href="#" class="footer-directory-column-section-anchor footer-directory-column-section-anchor-close"> <span class="footer-directory-column-section-anchor-label">Close Menu</span> </a>
                <ul class="footer-directory-column-section-list">
                        <li class="footer-directory-column-section-item"><a class="footer-directory-column-section-link" href="/accelerator/">App Accelerators</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/app-store-
awards/">App Store Awards</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/awards/">Apple
Design Awards</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/experts/#academies">Apple Developer Academies</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/entrepreneur-
camp/">Entrepreneur Camp</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tech-talks/">Tech
Talks</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/wwdc/">WWDC</a></li>
                        </ul>
                </div>
        </div>
        <!--googleon: all-->
</nav>
      <section class="footer-mini" vocab="http://schema.org/"
typeof="Organization">
        <div class="footer-mini-news">
                <div class="copy">
                        To view the latest developer news, visit <a
href="/news/">News and Updates</a>.
                </div>
                <div class="content">
                        <div class="color-scheme-toggle" role="radiogroup"
tabindex="0" aria-label="Select a color scheme preference">

                                <label data-color-scheme-option="light">

                                        <input type="radio" value="light"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Light</div>

                                </label>

                                <label data-color-scheme-option="dark">

                                        <input type="radio" value="dark"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Dark</div>

                                </label>

                                <label data-color-scheme-option="auto">
```

```
                                        <input type="radio" value="auto"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Auto</div>

                                    </label>

                            </div>
                            <script async="" src="/assets/scripts/color-scheme-
toggle.js"></script>
                    </div>
            </div>
            <link rel="stylesheet" href="/assets/styles/language-dropdown.css?
41172203193">
            <div class="language-dropdown dropdown-container" data-
lang="complete">
                    <select class="dropdown" aria-label="Language
Dropdown"><option
value="https://developer.apple.com/design/">English</option><option
value="https://developer.apple.com/cn/design/">□□□□</option><option
value="https://developer.apple.com/jp/design/">□□□</option><option
value="https://developer.apple.com/kr/design/">□□□</option></select>
                    <span class="dropdown-icon icon icon-chevrondown" aria-
hidden="true"></span>
            </div>
            <script async="" src="/assets/scripts/lib/jquery/jquery.language-
dropdown.js?41172203193"></script>
            <div class="footer-mini-legal">
                    <div class="footer-mini-legal-copyright">Copyright ©  2022 <a
href="https://www.apple.com">Apple Inc.</a> All rights reserved.</div>
                    <div class="footer-mini-legal-links">
                            <a class="footer-mini-legal-link"
href="https://www.apple.com/legal/internet-services/terms/site.html">Terms of
Use</a>
                            <a class="footer-mini-legal-link"
href="https://www.apple.com/legal/privacy/en-ww/">Privacy Policy</a>
                            <a class="footer-mini-legal-link"
href="/support/terms/">Agreements and Guidelines</a>
                    </div>
            </div>
</section>
    </div>
</footer>
            <!-- <script src="/assets/scripts/chapternav.js"></script> -->

</body></html>

<html xmlns="https://www.w3.org/1999/xhtml" xml:lang="en" lang="en"
class="js touch svg no-ie8 progressive-image"><head>

            <meta charset="utf-8">
<meta name="Author" content="Apple Inc.">
```

<meta name="viewport" content="width=device-width, initial-scale=1, viewport-fit=cover">
<link rel="shortcut icon" href="/favicon.ico">
<link rel="icon" href="/favicon.ico">
<link rel="mask-icon" href="/apple-logo.svg" color="#333333">

<link rel="stylesheet" href="/assets/styles/global.dist.css?41172203193" type="text/css">
<link rel="stylesheet" href="/assets/styles/dark-mode.css?41172203193" type="text/css" media="" data-color-scheme="dark">
<link rel="stylesheet" href="/assets/styles/localization.css?41172203193" type="text/css">

<script src="/assets/scripts/lib/jquery/jquery-3.6.0.min.js?41172203193"></script>
<script src="/assets/scripts/settings.js?41172203193"></script>
<script src="/assets/scripts/language-locales.js?41172203193"></script>
<script src="/assets/scripts/DeveloperBreadcrumbs.js?41172203193"></script>

<script async="" src="/assets/scripts/lib/jquery/jquery.retinate.js?41172203193"></script>
<script async="" src="/assets/scripts/global.js?41172203193"></script>
<script async="" src="/assets/scripts/global-logout.js?41172203193"></script>

<link rel="stylesheet" href="https://www.apple.com/wss/fonts?family=SF+Pro&v=2" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?family=SF+Pro+Icons&v=1" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?family=SF+Mono&v=2" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?family=Apple+Icons&v=1" type="text/css">

<title>Distribute - Apple Developer</title>
<meta name="omni_page" content="Distribute - (English)">
<meta name="Description" content="Learn how you can distribute your apps worldwide on the App Store.">

<meta property="og:locale" content="en_US">
<meta property="og:site_name" content="Apple Developer">
<meta property="og:type" content="website">
<meta property="og:image" content="https://developer.apple.com/news/images/og/distribute-og.jpg">
<meta property="og:title" content="Distribute - Apple Developer">
<meta property="og:description" content="Learn how you can distribute your apps worldwide on the App Store.">
<meta property="og:url" content="https://developer.apple.com/distribute/">

<meta name="twitter:card" content="summary_large_image">
<meta name="twitter:image" content="https://developer.apple.com/news/images/og/distribute-og-twitter.jpg">
<meta name="twitter:title" content="Distribute - Apple Developer">

```
	<meta name="twitter:description" content="Learn how you can distribute
your apps worldwide on the App Store.">
	<meta name="twitter:url"
content="https://developer.apple.com/distribute/">

	<link rel="alternate" href="https://developer.apple.com/distribute/"
hreflang="en">
	<link rel="alternate" href="https://developer.apple.com/cn/distribute/"
hreflang="zh-CN">
	<link rel="alternate" href="https://developer.apple.com/jp/distribute/"
hreflang="ja-JP">
	<link rel="alternate" href="https://developer.apple.com/kr/distribute/"
hreflang="ko-KR">
	<link rel="canonical" href="https://developer.apple.com/distribute/">

	<link rel="stylesheet" href="/assets/styles/router-strip.css"
type="text/css">
	<link rel="stylesheet" href="/distribute/styles/distribute.css?Tuesday, 12-
Jul-2022 17:06:29 GMT" type="text/css">
	<link rel="stylesheet" href="/distribute/styles/chapter-nav.css?Tuesday,
12-Jul-2022 17:06:29 GMT" type="text/css">
</head>
<body class="nav-distribute dmf" data-color-scheme="dark">

	<link rel="stylesheet" href="/assets/styles/globalnav.css?41172203193"
type="text/css">

<link rel="stylesheet" href="/assets/styles/suggest-lang.css?41172203193"
type="text/css">
<div id="suggest-lang" class="ribbon hide">
	<div class="ribbon-content-wrapper">
		<div class="ribbon-content row">
			<div class="column large-12 large-centered">
				<a id="suggest-closer" class="icon icon-after icon-
reset"></a>
				<p><a href="#" id="suggest-link" class="ribbon-link
more">View in English</a></p>
			</div>
		</div>
	</div>
</div>
<script src="/assets/scripts/suggest-lang.js?41172203193"></script>
<aside id="ac-gn-segmentbar" class="ac-gn-segmentbar" lang="en-US"
dir="ltr">
</aside>
<input type="checkbox" id="ac-gn-menustate" class="ac-gn-menustate">
<nav id="ac-globalnav" class="js touch no-windows" role="navigation" aria-
label="Global" data-hires="false" data-analytics-region="global nav" lang="en-
US" dir="ltr" data-www-domain="www.apple.com" data-store-locale="us" data-
store-root-path="/us" data-store-api="/[storefront]/shop/bag/status" data-
search-locale="en_US"
data-search-suggestions-api="/search-services/suggestions/" data-search-
defaultlinks-api="/search-services/suggestions/defaultlinks/" data-search-
suggestions-enabled="false">
```

```
<div class="ac-gn-content">
	<ul class="ac-gn-header">
		<li class="ac-gn-item ac-gn-menuicon">
			<label class="ac-gn-menuicon-label" for="ac-gn-menustate" aria-hidden="true">
				<span class="ac-gn-menuicon-bread ac-gn-menuicon-bread-top">
					<span class="ac-gn-menuicon-bread-crust ac-gn-menuicon-bread-crust-top"></span>
				</span>
				<span class="ac-gn-menuicon-bread ac-gn-menuicon-bread-bottom">
					<span class="ac-gn-menuicon-bread-crust ac-gn-menuicon-bread-crust-bottom"></span>
				</span>
			</label>
			<a href="#ac-gn-menustate" role="button" class="ac-gn-menuanchor ac-gn-menuanchor-open" id="ac-gn-menuanchor-open">
				<span class="ac-gn-menuanchor-label">Global Nav Open Menu</span>
			</a>
			<a href="#" role="button" class="ac-gn-menuanchor ac-gn-menuanchor-close" id="ac-gn-menuanchor-close">
				<span class="ac-gn-menuanchor-label">Global Nav Close Menu</span>
			</a>
		</li>
		<li class="ac-gn-item ac-gn-apple">
			<a class="ac-gn-link ac-gn-link-apple-developer" href="/" data-analytics-title="appledeveloper home" id="ac-gn-firstfocus-small">
				<span class="ac-gn-link-text">Apple Developer</span>
			</a>
		</li>
	</ul>
	<div class="ac-gn-search-placeholder-container" role="search">
		<div class="ac-gn-search ac-gn-search-small">
			<a id="ac-gn-link-search-small" class="ac-gn-link" href="/search/" data-analytics-title="search" data-analytics-click="search" data-analytics-intrapage-link="" aria-label="Search" role="button" aria-haspopup="true">
				<div class="ac-gn-search-placeholder-bar">
					<div class="ac-gn-search-placeholder-input">
						<div class="ac-gn-search-placeholder-input-text" aria-hidden="true">
							<div class="ac-gn-link-search ac-gn-search-placeholder-input-icon"></div>
							<span class="ac-gn-search-placeholder">Search</span>
						</div>
	</div>
```

```
                                                <div class="ac-gn-searchview-close ac-
gn-searchview-close-small ac-gn-search-placeholder-searchview-close">
                                                        <span class="ac-gn-searchview-
close-cancel" aria-hidden="true">Cancel</span>
                                                <div>
                                        </div>
                                </a>
                        </div>
                </div>
                <ul class="ac-gn-list">
                        <li class="ac-gn-item ac-gn-apple">
                                <a class="ac-gn-link ac-gn-link-apple-developer"
href="/" data-analytics-title="appledeveloper home" id="ac-gn-firstfocus">
                                        <span class="ac-gn-link-text">Apple
Developer</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-news">
                                <a class="ac-gn-link ac-gn-link-news" href="/news/"
data-analytics-title="news">
                                        <span class="ac-gn-link-text">News</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-discover">
                                <a class="ac-gn-link ac-gn-link-discover"
href="/discover/" data-analytics-title="discover">
                                        <span
class="ac-gn-link-text">Discover</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-design">
                                <a class="ac-gn-link ac-gn-link-design" href="/design/"
data-analytics-title="design">
                                        <span class="ac-gn-link-text">Design</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-develop">
                                <a class="ac-gn-link ac-gn-link-develop"
href="/develop/" data-analytics-title="develop">
                                        <span class="ac-gn-link-text">Develop</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-distribute">
                                <a class="ac-gn-link ac-gn-link-distribute"
href="/distribute/" data-analytics-title="distribute">
                                        <span
class="ac-gn-link-text">Distribute</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-dsupport">
                                <a class="ac-gn-link ac-gn-link-dsupport"
href="/support/" data-analytics-title="dsupport">
                                        <span class="ac-gn-link-text">Support</span>
                                        </a>
```

```
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-account">
                                <a class="ac-gn-link ac-gn-link-account"
href="/account/" data-analytics-title="account">
                                        <span class="ac-gn-link-text">Account</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-search"
role="search">
                                <a id="ac-gn-link-search" class="ac-gn-link ac-gn-link-
search" href="/search/" data-analytics-title="search" data-analytics-
click="search" data-analytics-intrapage-link="" aria-label="Search"
role="button" aria-haspopup="true"></a>
                        </li>
                </ul>
                <aside id="ac-gn-searchview" class="ac-gn-searchview"
role="search" data-analytics-region="search">
                        <div class="ac-gn-searchview-content">
                                <div class="ac-gn-searchview-bar">
                                        <div class="ac-gn-searchview-bar-wrapper">
                                                <form id="ac-gn-searchform" class="ac-
gn-searchform" action="/search/" method="get">
                                                        <div class="ac-gn-searchform-
wrapper">
                                                                <input id="ac-gn-
searchform-input" class="ac-gn-searchform-input" type="text" name="q" aria-
label="Search" placeholder="Search" autocorrect="off" autocapitalize="off"
autocomplete="off" spellcheck="false" role="combobox" aria-
autocomplete="list" aria-expanded="true" aria-owns="quicklinks suggestions">
                                                                <button id="ac-gn-
searchform-submit" class="ac-gn-searchform-submit" type="submit"
disabled="" aria-label="Submit Search"></button>
                                                                <button id="ac-gn-
searchform-reset" class="ac-gn-searchform-reset" type="reset" disabled=""
aria-label="Clear Search">
                                                                        <span
class="ac-gn-searchform-reset-background"></span>
                                                                </button>
                                                        </div>
                                                </form>
                                                <button id="ac-gn-searchview-close-
small" class="ac-gn-searchview-close ac-gn-searchview-close-small" aria-
label="Cancel Search">
                                                                <span class="ac-gn-
searchview-close-cancel" aria-hidden="true">
                                                                        Cancel
                                                                </span>
                                                        </button>
                                        </div>
                                </div>
                                <aside id="ac-gn-searchresults" class="ac-gn-
searchresults" data-string-quicklinks="Quick Links" data-string-
suggestions="Suggested Searches" data-string-noresults="">
```

```
                <section class="ac-gn-searchresults-section ac-gn-searchresults-
section-defaultlinks">
                    <div class="ac-gn-searchresults-section-wrapper">
                                                <div class="search-group-
checkbox hidden"><input id="group-input" type="checkbox" name="group-
filter" checked="">Only search within “<span
id="group-search-label"></span>”</div>
                        <h3 class="ac-gn-searchresults-header ac-gn-searchresults-
animated">Quick Links</h3>
                        <ul class="ac-gn-searchresults-list" id="defaultlinks"
role="listbox">
                        <li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a href="https://developer.apple.com/ios/" id="search-group-link-0"
class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">iOS
16</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a href="https://developer.apple.com/news/" id="search-group-link-
1" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">Latest
News</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-
animated"><a
href="https://developer.apple.com/documentation/storekit/appstore/
environment/3963900-xcode/" id="search-group-link-2" class="ac-gn-
searchresults-link ac-gn-searchresults-link-defaultlinks">xcode</a></li><li
class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a
href="https://developer.apple.com/xcode/whats-new/" id="search-group-link-3"
class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">What’s
included in Xcode</a></li><li class="ac-gn-searchresults-item ac-gn-
searchresults-animated"><a
href="https://developer.apple.com/videos/play/wwdc2022/110345/" id="search-
group-link-4" class="ac-gn-searchresults-link ac-gn-searchresults-link-
defaultlinks">What’s new in Endpoint Security</a></li></ul>
                        <span role="status" class="ac-gn-searchresults-count" aria-
live="polite">5 Quick Links</span>
                    </div>
                </section>
            </aside>
                        </div>
                        <button id="ac-gn-searchview-close" class="ac-gn-
searchview-close" aria-label="Cancel Search">
                                        <span class="ac-gn-searchview-close-
wrapper">
                                                <span class="ac-gn-searchview-close-
left"></span>
                                                <span class="ac-gn-searchview-close-
right"></span>
                                        </span>
                                    </button>
                </aside>
                        </div>
</nav>
<div class="ac-gn-blur"></div>
<div id="ac-gn-curtain" class="ac-gn-curtain"></div>
<div id="ac-gn-placeholder" class="ac-nav-placeholder"></div>
<script src="/assets/scripts/ac-globalnav.built.js?41172203193"></script><div
id="ac-gn-viewport-emitter"> </div>
```

```
<link rel="stylesheet" href="/assets/styles/search.css?41172203193">
<script src="/assets/scripts/search.js?41172203193"></script>

        <!-- metrics -->
<script>
   /* RSID: */
   var s_account="awdappledeveloper"
</script>
<script src="/assets/metrics/scripts/analytics.js?10202020"></script>
<script>
   s.pageName= AC && AC.Tracking && AC.Tracking.pageName();
   s.channel="www.en.developer"
   s.channel="www.en.developer";


   /************* DO NOT ALTER ANYTHING BELOW THIS LINE ! **************/
   var s_code=s.t();if(s_code)document.write(s_code)
</script>
<!-- /metrics -->

        <link rel="stylesheet" property="stylesheet"
href="/assets/styles/chapternav.css" type="text/css">
<nav id="chapternav" class="chapternav theme-dark">
        <div class="chapternav-wrapper">
                <ul class="chapternav-items">
                        <li class="chapternav-item chapternav-item-app-store">
                                <a class="chapternav-link" href="/app-store/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span class="chapternav-label">App
Store</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-macos">
                                <a class="chapternav-link"
href="/macos/distribution/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span
class="chapternav-label">macOS</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-custom-apps">
                                <a class="chapternav-link" href="/custom-apps/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span class="chapternav-label">Custom
Apps</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-safari">
                                <a class="chapternav-link"
href="/safari/extensions/">
```

```
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span class="chapternav-label">Safari
Extensions</span>
                                </a>
                        </li>
                        <li class="chapternav-item chapternav-item-program">
                                <a class="chapternav-link" href="/programs/">
                                        <figure class="chapternav-icon" data-hires-
status="pending"></figure>
                                        <span
class="chapternav-label">Program</span>
                                </a>
                        </li>
                </ul>
                <div class="chapternav-paddles">
                        <button class="chapternav-paddle chapternav-paddle-left"
aria-hidden="true" disabled=""></button>
                        <button class="chapternav-paddle chapternav-paddle-right"
aria-hidden="true" disabled=""></button>
                </div>
        </div>
</nav>
<script src="/assets/scripts/chapternav.js"></script>

        <main id="main" class="main" role="main">

                <div class="ribbon ribbon-blue">
                        <div class="ribbon-drop-wrapper">
                                <div class="ribbon-content-wrapper">
                                        <div class="ribbon-content row">
                                                <div class="column large-centered large-
12">
                                                        <p>
                                                                <a href="/app-store/small-
business-program/" class="ribbon-link more">Enroll in the App Store Small
Business Program</a>
                                                        </p>
                                                </div>
                                        </div>
                                </div>
                        </div>
                </div>

                <section class="section section-hero bg-light"
role="presentation">
                        <a href="/app-store/" class="section-link">
                                <div class="section-content">
                                        <div class="row">
                                                <div class="column large-centered large-
12 text-center">
                                                        <figure class="icon-app-store
center" data-hires-status="pending"></figure>
```

```
                                                <h1 class="typography-
headline">App Store</h1>
                                                <p class="typography-intro
center">The <span class="nowrap">App Store</span> lets you easily deliver
apps to hundreds of millions of people around the world on their Mac, iPhone,
iPad, <span class="nowrap">Apple Watch,</span> and <span
class="nowrap">Apple TV.</span> With over <span class="nowrap">$260
billion</span> paid to developers and a rapid adoption rate of new software by
Apple customers, it’s an incredible time to distribute on
Apple platforms.</p>
                                                <p class="typography-intro
center"><span class="more">Learn how to make the most of the <span
class="nowrap">App Store</span></span></p>
                                        </div>
                                    </div>
                                </div>
                                <figure class="distribute-hero" data-hires-
status="pending"></figure>
                            </a>
                        </section>

                        <section class="section section-mac-app-store bg-light">
                            <a href="/macos/distribution/" class="section-link">
                                <div class="section-content text-center">
                                    <div class="row">
                                        <div class="column large-centered large-
8 small-12 text-center">
                                                <h2>macOS</h2>
                                                <p class="typography-
intro">Learn how the <span class="nowrap">Mac App Store</span> beautifully
showcases your apps and makes them even easier to find, and how <span
class="nowrap">Developer ID</span> and notarization make it safer for users
to install apps that you distribute yourself.</p>
                                                <p class="typography-
intro"><span class="more">Learn about distribution on macOS</span></p>
                                        </div>
                                    </div>
                                </div>
                                <figure class="device-macos device-macbook-pro-16-
space-gray center" role="img" alt="MacBook Pro displaying the current Featured
App on the App Store Discover tab" aria-label="MacBook Pro displaying the
current Featured App on the App Store Discover tab" data-hires-
status="pending" style="background-image:
url(&quot;https://developer.apple.com/assets/elements/hardware/macbook_pro_
16_space_gray/small_2x.png?156454&quot;);">
                                    <picture class="device-screen">
                                        <source media="(max-width:735px)"
srcset="/distribute/images/screen-mac-app-store-small_2x.jpg">
                                        <source media="(max-width:1068px)"
srcset="/distribute/images/screen-mac-app-store-medium_2x.jpg">
                                        <img src="/distribute/images/screen-
mac-app-store-large_2x.jpg" width="100%" data-hires-status="pending">
                                    </picture>
                                </figure>
```

```
                </a>
        </section>

        <section class="section section-silicon bg-light">
                <div class="section-content text-center">
                        <div class="row">
                                <div class="column large-centered large-12
text-center">
                                        <a href="/macos/iphone-and-ipad-apps/"
class="tile-link">
                                                <div class="tile-wrap">
                                                        <figure class="tile-icon icon-
mac-app-store center" data-hires-status="pending"></figure>
                                                        <h3>iPhone and iPad apps
on the <span class="nowrap">Mac App Store</span></h3>
                                                        <p>iPhone apps and iPad
apps are available without modification on <span class="nowrap">Apple silicon
Macs,</span> opening new possibilities for users and
developers alike.</p>
                                                        <p><span
class="more">Learn more</span></p>
                                                </div>
                                        </a>
                                </div>
                        </div>
                </div>
        </section>

        <section class="section section-business bg-light">
                <a href="/custom-apps/" class="section-link">
                        <div class="section-content overflow">
                                <div class="row">
                                        <div class="column large-centered large-
12 text-center">
                                                <h2>Custom Apps</h2>
                                                <p class="large-centered large-8
medium-10 small-12 typography-intro">Engage with businesses and educational
institutions to design and build customized apps that meet the unique needs of
their organization. With Apple Business Manager and Apple School Manager, you
can privately and securely distribute to specific partners, clients, franchisees.
And you can also distribute proprietary apps to your
internal employees.</p>
                                                <p class="typography-
intro"><span class="more">Learn about Custom Apps</span></p>
                                        </div>
                                </div>
                        </div>
                        <figure class="image-business center margin-top-
small" data-hires-status="pending"></figure>
                </a>
        </section>

        <section class="section section-safari bg-light">
                <a href="/safari/extensions/" class="section-link">
```

```
                                <div class="section-content">
                                        <div class="row">
                                                <div class="column large-centered large-
8 medium-10 small-12 text-center">
                                                        <h2>Safari Extensions</h2>
                                                        <p class="typography-
intro">Enhance and customize the web browsing experience on Mac, iPhone,
and iPad with <span class="nowrap">Safari Extensions.</span> Using powerful
native APIs and frameworks, as well as familiar web technologies such as HTML,
CSS, and JavaScript, you can easily create <span class="nowrap">Safari
Extensions</span> in Xcode and distribute them on the <span
class="nowrap">App Store</span> or get them notarized for distribution
outside the <span class="nowrap">Mac App Store.</span></p>
                                                        <p class="typography-
intro"><span class="more">Learn about Safari Extensions</span></p>
                                                </div>
                                        </div>
                                </div>
                                <figure class="device-safari device-macbook-pro-
space-grey center" data-hires-status="pending" style="background-image:
url(&quot;https://developer.apple.com/assets/elements/hardware/macbook_pro_s
pace_grey/small_2x.png?156454&quot;);">
                                        <figure class="device-screen screen-safari"
data-hires-status="pending"></figure>
                                </figure>
                        </a>
                </section>

                <section class="section section-submote bg-light">
                        <div class="section-content">
                                <div class="row">
                                        <div class="column large-6 small-12">
                                                <a href="/app-store/submitting/"
class="tile-link">
                                                        <div class="tile-wrap">
                                                                <figure class="tile-icon icon-
submitting center" data-hires-status="pending"></figure>
                                                                <h3>Submitting your
apps</h3>
                                                                <p>Learn how to prepare
your iPhone, iPad, Mac, <span class="nowrap">Apple TV,</span> and <span
class="nowrap">Apple Watch</span> apps for submission to <span
class="nowrap">App Review.</span></p>
                                                                <p><span
class="more">Learn more</span></p>
                                                        </div>
                                                </a>
                                        </div>
                                        <div class="column large-6 small-12">
                                                <a href="/app-store/promote/"
class="tile-link">
                                                        <div class="tile-wrap">
                                                                <figure class="tile-icon icon-
promote center" data-hires-status="pending"></figure>
```

```
                                                        <h3>Promoting your
apps</h3>
                                                        <p>Get marketing assets to
help promote your apps, and learn about getting featured on the <span
class="nowrap">App Store.</span></p>
                                                        <p><span
class="more">Learn more</span></p>
                                                    </div>
                                                </a>
                                            </div>
                                        </div>
                                    </section>

                                    <section class="section section-adp theme-dark">
                                        <a href="/programs/" class="section-link">
                                            <div class="section-content text-center">
                                                <div class="narrow-column">
                                                    <img
src="/app-store/features/images/members.svg" width="144" alt="" data-hires-
status="pending">
                                                    <h2><span class="eyebrow">Apple
Developer Program</span>One membership. All platforms.</h2>
                                                    <p class="typography-intro">Join the
<span class="nowrap">Apple Developer</span> Program to reach customers
around the world on the <span class="nowrap">App Store</span> for iPhone,
iPad, Mac, <span class="nowrap">Apple Watch,</span> <span
class="nowrap">Apple TV,</span> and iMessage. You'll also get access to beta
software, advanced app capabilities, extensive beta testing tools, and
app analytics.</p>
                                                    <p class="typography-intro"><span
class="more">Learn about membership</span></p>
                                                </div>
                                            </div>
                                        </a>
                                    </section>

                                </main>

                                <aside class="section developer-router-links">
                                    <div class="section-content">
                                    <div class="row">
                                        <div class="column large-3 medium-6 small-6">
                                            <a href="/app-store-connect/" class="block text-
center">
                                                <figure class="router-icon router-icon-manage-
outline" data-hires-status="pending"></figure>
                                                <p><strong>App Store Connect</strong></p>
                                                <p class="typography-subbody">Manage apps,
analytics, sales reports, agreements, tax and banking information, and
more.</p>
                                                <p class="typography-subbody"><span
class="block-link more">Learn more</span></p>
                                            </a>
```

```
                        </div>
                        <div class="column large-3 medium-6 small-6">
                                <a href="/support/articles/#distribution" class="block
text-center">
                                        <figure class="router-icon router-icon-
document" data-hires-status="pending"></figure>
                                        <p><strong>Documentation &amp;
Help</strong></p>
                                        <p class="typography-subbody">View
documentation on distributing your apps on the <span class="nowrap">App
Store,</span> in-house, and more.</p>
                                        <p class="typography-subbody"><span
class="block-link more">Learn more</span></p>
                                </a>
                        </div>
                        <div class="column large-3 medium-6 small-6">
                                <a href="/videos/business-distribution/" class="block
text-center">
                                        <figure class="router-icon router-icon-videos"
data-hires-status="pending"></figure>
                                        <p><strong>Session Videos</strong></p>
                                        <p class="typography-subbody">See the latest
in Apple technologies presented at WWDC and other events.</p>
                                        <p class="typography-subbody"><span
class="block-link more">Watch videos</span></p>
                                </a>
                        </div>
                        <div class="column large-3 medium-6 small-6">
                                <a
href="https://developer.apple.com/forums/tags/app-store-connect" class="block
text-center">
                                        <figure class="router-icon router-icon-forum"
data-hires-status="pending"></figure>
                                        <p><strong>Discussion Forums</strong></p>
                                        <p class="typography-subbody">Ask questions
and discuss development topics with Apple engineers and
other developers.</p>
                                        <p class="typography-subbody"><span
class="block-link more">View forums</span></p>
                                </a>
                        </div>
                </div>
                </div>
        </aside>

        <link rel="stylesheet" href="/assets/styles/footer.dist.css?
41172203193">
<footer id="footer" class="footer" role="contentinfo" aria-labelledby="footer-
label">
   <div class="footer-content">
      <h2 class="footer-label" id="footer-label">Developer Footer</h2>
        <developer-breadcrumbs style="display: block;">
```

```
        <nav class="footer-breadcrumbs" aria-label="Breadcrumbs"><a
href="https://www.apple.com/" class="home footer-breadcrumbs-home"><span
class="footer-breadcrumbs-home-icon" aria-hidden="true" data-hires-
status="pending">□</span><span class="footer-breadcrumbs-home-
label">Apple</span></a><div class="footer-breadcrumbs-path"><ol
class="footer-breadcrumbs-list"><li class="footer-breadcrumbs-item"><a
href="/">Developer</a></li><li class="footer-breadcrumbs-
item">Distribute</li></ol></div></nav></developer-breadcrumbs>
                <nav class="footer-directory" aria-label="Apple Developer Directory"
role="navigation">
        <!--googleoff: all-->
        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-platform">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-platform">
                                <h3 class="footer-directory-column-section-
title">Platforms</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-platform"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ios/">iOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ipados/">iPadOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/macos/">macOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tvos/">tvOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/watchos/">watchOS</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-tools">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-tools">
                                <h3 class="footer-directory-column-section-
title">Tools</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-tools"
class="footer-directory-column-section-anchor footer-directory-column-section-
```

anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu
<a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu
<ul class="footer-directory-column-section-list">
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift/">Swift
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swiftui/">SwiftUI
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift-playgrounds/">Swift
Playgrounds
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/testflight/">TestFlight
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode/">Xcode
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode-cloud/">Xcode
Cloud
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/sf-symbols/">SF
Symbols

<input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-topics">

<label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-topics">
<h3 class="footer-directory-column-section-
title">Topics & Technologies</h3>
</label>
<a href="#footer-directory-column-section-state-topics"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu
<a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu
<ul class="footer-directory-column-section-list">
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessibility/">Accessibility
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessories/">Accessories
<li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-extensions/">App
Extensions

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/">App
Store</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/audio/">Audio &amp;
Video</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/augmented-
reality/">Augmented Reality</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/business/">Business</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/">Design</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/distribute/">Distribution</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/education/">Education</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/fonts/">Fonts</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/games/">Games</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/health-fitness/">Health
&amp; Fitness</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/in-app-purchase/">In-App
Purchase</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/localization/">Localization</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/maps/">Maps &amp;
Location</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/machine-learning/">Machine
Learning</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/security/">Security</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/safari/">Safari &amp;
Web</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-resources">
                <div class="footer-directory-column-section">
```

```
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-resources">
                                <h3 class="footer-directory-column-section-
title">Resources</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-resources"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/documentation/">Documentation</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/curriculum/">Curriculum</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/download/">Downloads</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://developer.apple.com/forums/">Forums</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/videos/">Videos</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-support">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-support">
                                <h3 class="footer-directory-column-section-
title">Support</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-support"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/support/articles/">Support
Articles</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/contact/">Contact
Us</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/bug-reporting/">Bug
Reporting</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/system-status/">System
Status</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-account">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-account">
                                <h3 class="footer-directory-column-section-
title">Account</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-account"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/account/">Apple
Developer</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://appstoreconnect.apple.com/">App Store Connect</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/account/ios/certificate/">Certificates, IDs, &amp; Profiles</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://feedbackassistant.apple.com/">Feedback Assistant</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-programs">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-programs">
                                <h3 class="footer-directory-column-section-
title">Programs</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-programs"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
```

```
                <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                <ul class="footer-directory-column-section-list">
                        <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/">Apple Developer
Program</a></li>
                        <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/enterprise/">Apple
Developer Enterprise Program</a></li>
                        <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/small-business-
program/">App Store Small Business Program</a></li>
                        <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="https://mfi.apple.com/">MFi
Program</a></li>
                        <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/news-
partner/">News Partner Program</a></li>
                        <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/video-
partner/">Video Partner Program</a></li>
                        <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/security-bounty/">Security
Bounty Program</a></li>
                        <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/security-research-
device/">Security Research Device Program</a></li>
                </ul>
        </div>

        <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-events">
        <div class="footer-directory-column-section">
                <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-events">
                        <h3 class="footer-directory-column-section-
title">Events</h3>
                </label>
                <a href="#footer-directory-column-section-state-events"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                <ul class="footer-directory-column-section-list">
                        <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/accelerator/">App
Accelerators</a></li>
                        <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/app-store-
awards/">App Store Awards</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/awards/">Apple
Design Awards</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/experts/#academies">Apple Developer Academies</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/entrepreneur-
camp/">Entrepreneur Camp</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tech-talks/">Tech
Talks</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/wwdc/">WWDC</a></li>
                        </ul>
                </div>
        </div>
        <!--googleon: all-->
</nav>
      <section class="footer-mini" vocab="http://schema.org/"
typeof="Organization">
        <div class="footer-mini-news">
                <div class="copy">
                        To view the latest developer news, visit <a
href="/news/">News and Updates</a>.
                </div>
                <div class="content">
                        <div class="color-scheme-toggle" role="radiogroup"
tabindex="0" aria-label="Select a color scheme preference">

                                <label data-color-scheme-option="light">

                                        <input type="radio" value="light"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Light</div>

                                </label>

                                <label data-color-scheme-option="dark">

                                        <input type="radio" value="dark"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Dark</div>

                                </label>

                                <label data-color-scheme-option="auto">
```

```
                                        <input type="radio" value="auto"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Auto</div>

                                    </label>

                            </div>
                            <script async="" src="/assets/scripts/color-scheme-
toggle.js"></script>
                    </div>
            </div>
            <link rel="stylesheet" href="/assets/styles/language-dropdown.css?
41172203193">
            <div class="language-dropdown dropdown-container" data-
lang="complete">
                    <select class="dropdown" aria-label="Language
Dropdown"><option
value="https://developer.apple.com/distribute/">English</option><option
value="https://developer.apple.com/cn/distribute/">□□□□</option><option
value="https://developer.apple.com/jp/distribute/">□□□</option><option
value="https://developer.apple.com/kr/distribute/">□□□</option></select>
                    <span class="dropdown-icon icon icon-chevrondown" aria-
hidden="true"></span>
            </div>
            <script async="" src="/assets/scripts/lib/jquery/jquery.language-
dropdown.js?41172203193"></script>
            <div class="footer-mini-legal">
                    <div class="footer-mini-legal-copyright">Copyright ©  2022 <a
href="https://www.apple.com">Apple Inc.</a> All rights reserved.</div>
                    <div class="footer-mini-legal-links">
                            <a class="footer-mini-legal-link"
href="https://www.apple.com/legal/internet-services/terms/site.html">Terms of
Use</a>
                            <a class="footer-mini-legal-link"
href="https://www.apple.com/legal/privacy/en-ww/">Privacy Policy</a>
                            <a class="footer-mini-legal-link"
href="/support/terms/">Agreements and Guidelines</a>
                    </div>
            </div>
</section>
    </div>
</footer>


</body></html>

<html xmlns="https://www.w3.org/1999/xhtml" xml:lang="en"
lang="en"><head>
            <meta charset="utf-8">
<meta name="Author" content="Apple Inc.">
<meta name="viewport" content="width=device-width, initial-scale=1,
viewport-fit=cover">
```

```
<link rel="shortcut icon" href="/favicon.ico">
<link rel="icon" href="/favicon.ico">
<link rel="mask-icon" href="/apple-logo.svg" color="#333333">

<link rel="stylesheet" href="/assets/styles/global.dist.css?41172203193"
type="text/css">
<link rel="stylesheet" href="/assets/styles/dark-mode.css?41172203193"
type="text/css" media="" data-color-scheme="dark">
<link rel="stylesheet" href="/assets/styles/localization.css?41172203193"
type="text/css">

<script src="/assets/scripts/lib/jquery/jquery-3.6.0.min.js?41172203193"></
script>
<script src="/assets/scripts/settings.js?41172203193"></script>
<script src="/assets/scripts/language-locales.js?41172203193"></script>
<script src="/assets/scripts/DeveloperBreadcrumbs.js?41172203193"></script>

<script async="" src="/assets/scripts/lib/jquery/jquery.retinate.js?
41172203193"></script>
<script async="" src="/assets/scripts/global.js?41172203193"></script>
<script async="" src="/assets/scripts/global-logout.js?41172203193"></script>

        <link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Pro&amp;v=2" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Pro+Icons&amp;v=1" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=SF+Mono&amp;v=2" type="text/css">
<link rel="stylesheet" href="https://www.apple.com/wss/fonts?
family=Apple+Icons&amp;v=1" type="text/css">

        <title>Support - Apple Developer</title>
        <meta name="omni_page" content="Support - (English)">
        <meta name="Description" content="Get help with Apple Developer
Program enrollment and managing your developer account.">
                <link rel="alternate" href="https://developer.apple.com/support/"
hreflang="en">
                <link rel="alternate"
href="https://developer.apple.com/cn/support/" hreflang="zh-CN">
                <link rel="alternate"
href="https://developer.apple.com/jp/support/" hreflang="ja-JP">
                <link rel="alternate"
href="https://developer.apple.com/kr/support/" hreflang="ko-KR">
                <link rel="alternate"
href="https://developer.apple.com/de/support/" hreflang="de-DE">
                <link rel="alternate"
href="https://developer.apple.com/es/support/" hreflang="es-lamr">
                <link rel="alternate" href="https://developer.apple.com/fr/support/"
hreflang="fr-FR">
                <link rel="alternate" href="https://developer.apple.com/it/support/"
hreflang="it-IT">
                <link rel="alternate"
href="https://developer.apple.com/pt/support/" hreflang="pt-BR">
                <link rel="canonical" href="https://developer.apple.com/support/">
```

```
                                        <link rel="stylesheet" type="text/css"
href="/support/styles/index.css?10172203193&quot;&gt;">
                                                    </head>
<body id="overview" class="dmf en nav-support" data-color-scheme="dark">

        <link rel="stylesheet" href="/assets/styles/globalnav.css?41172203193"
type="text/css">

<link rel="stylesheet" href="/assets/styles/suggest-lang.css?41172203193"
type="text/css">
<div id="suggest-lang" class="ribbon hide">
        <div class="ribbon-content-wrapper">
                <div class="ribbon-content row">
                        <div class="column large-12 large-centered">
                                <a id="suggest-closer" class="icon icon-after icon-
reset"></a>
                                <p><a href="#" id="suggest-link" class="ribbon-link
more">View in English</a></p>
                        </div>
                </div>
        </div>
</div>
<script src="/assets/scripts/suggest-lang.js?41172203193"></script>
<aside id="ac-gn-segmentbar" class="ac-gn-segmentbar" lang="en-US"
dir="ltr">
</aside>
<input type="checkbox" id="ac-gn-menustate" class="ac-gn-menustate">
<nav id="ac-globalnav" class="js touch no-windows" role="navigation" aria-
label="Global" data-hires="false" data-analytics-region="global nav" lang="en-
US" dir="ltr" data-www-domain="www.apple.com" data-store-locale="us" data-
store-root-path="/us" data-store-api="/[storefront]/shop/bag/status" data-
search-locale="en_US"
data-search-suggestions-api="/search-services/suggestions/" data-search-
defaultlinks-api="/search-services/suggestions/defaultlinks/" data-search-
suggestions-enabled="false">
        <div class="ac-gn-content">
                <ul class="ac-gn-header">
                        <li class="ac-gn-item ac-gn-menuicon">
                                <label class="ac-gn-menuicon-label" for="ac-gn-
menustate" aria-hidden="true">
                                        <span class="ac-gn-menuicon-bread ac-gn-
menuicon-bread-top">
                                                <span class="ac-gn-menuicon-bread-
crust ac-gn-menuicon-bread-crust-top"></span>
                                        </span>
                                        <span class="ac-gn-menuicon-bread ac-gn-
menuicon-bread-bottom">
                                                <span class="ac-gn-menuicon-bread-
crust ac-gn-menuicon-bread-crust-bottom"></span>
                                        </span>
                                </label>
```

```
                <a href="#ac-gn-menustate" role="button" class="ac-gn-menuanchor ac-gn-menuanchor-open" id="ac-gn-menuanchor-open">
                    <span class="ac-gn-menuanchor-label">Global Nav Open Menu</span>
                </a>
                <a href="#" role="button" class="ac-gn-menuanchor ac-gn-menuanchor-close" id="ac-gn-menuanchor-close">
                    <span class="ac-gn-menuanchor-label">Global Nav Close Menu</span>
                </a>
            </li>
            <li class="ac-gn-item ac-gn-apple">
                <a class="ac-gn-link ac-gn-link-apple-developer" href="/" data-analytics-title="appledeveloper home" id="ac-gn-firstfocus-small">
                    <span class="ac-gn-link-text">Apple Developer</span>
                </a>
            </li>
        </ul>
        <div class="ac-gn-search-placeholder-container" role="search">
            <div class="ac-gn-search ac-gn-search-small">
                <a id="ac-gn-link-search-small" class="ac-gn-link" href="/search/" data-analytics-title="search" data-analytics-click="search" data-analytics-intrapage-link="" aria-label="Search" role="button" aria-haspopup="true">
                    <div class="ac-gn-search-placeholder-bar">
                        <div class="ac-gn-search-placeholder-input">
                            <div class="ac-gn-search-placeholder-input-text" aria-hidden="true">
                                <div class="ac-gn-link-search ac-gn-search-placeholder-input-icon"></div>
                                <span class="ac-gn-search-placeholder">Search</span>
                            </div>
                        </div>
                        <div class="ac-gn-searchview-close ac-gn-searchview-close-small ac-gn-search-placeholder-searchview-close">
                            <span class="ac-gn-searchview-close-cancel" aria-hidden="true">Cancel</span>
                        </div>
                    </div>
                </a>
            </div>
        </div>
        <ul class="ac-gn-list">
            <li class="ac-gn-item ac-gn-apple">
                <a class="ac-gn-link ac-gn-link-apple-developer" href="/" data-analytics-title="appledeveloper home" id="ac-gn-firstfocus">
                    <span class="ac-gn-link-text">Apple Developer</span>
                </a>
            </li>
```

```
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-news">
                                <a class="ac-gn-link ac-gn-link-news" href="/news/"
data-analytics-title="news">
                                        <span class="ac-gn-link-text">News</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-discover">
                                <a class="ac-gn-link ac-gn-link-discover"
href="/discover/" data-analytics-title="discover">
                                        <span
class="ac-gn-link-text">Discover</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-design">
                                <a class="ac-gn-link ac-gn-link-design" href="/design/"
data-analytics-title="design">
                                        <span class="ac-gn-link-text">Design</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-develop">
                                <a class="ac-gn-link ac-gn-link-develop"
href="/develop/" data-analytics-title="develop">
                                        <span class="ac-gn-link-text">Develop</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-distribute">
                                <a class="ac-gn-link ac-gn-link-distribute"
href="/distribute/" data-analytics-title="distribute">
                                        <span
class="ac-gn-link-text">Distribute</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-dsupport">
                                <a class="ac-gn-link ac-gn-link-dsupport"
href="/support/" data-analytics-title="dsupport">
                                        <span class="ac-gn-link-text">Support</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-account">
                                <a class="ac-gn-link ac-gn-link-account"
href="/account/" data-analytics-title="account">
                                        <span class="ac-gn-link-text">Account</span>
                                        </a>
                        </li>
                        <li class="ac-gn-item ac-gn-item-menu ac-gn-search"
role="search">
                                <a id="ac-gn-link-search" class="ac-gn-link ac-gn-link-
search" href="/search/" data-analytics-title="search" data-analytics-
click="search" data-analytics-intrapage-link="" aria-label="Search"
role="button" aria-haspopup="true"></a>
                        </li>
                </ul>
                <aside id="ac-gn-searchview" class="ac-gn-searchview"
role="search" data-analytics-region="search">
```

```
                    <div class="ac-gn-searchview-content">
                        <div class="ac-gn-searchview-bar">
                            <div class="ac-gn-searchview-bar-wrapper">
                                <form id="ac-gn-searchform" class="ac-gn-searchform" action="/search/" method="get">
                                    <div class="ac-gn-searchform-wrapper">
                                        <input id="ac-gn-searchform-input" class="ac-gn-searchform-input" type="text" name="q" aria-label="Search" placeholder="Search" autocorrect="off" autocapitalize="off" autocomplete="off" spellcheck="false" role="combobox" aria-autocomplete="list" aria-expanded="true" aria-owns="quicklinks suggestions">
                                        <button id="ac-gn-searchform-submit" class="ac-gn-searchform-submit" type="submit" disabled="" aria-label="Submit Search"></button>
                                        <button id="ac-gn-searchform-reset" class="ac-gn-searchform-reset" type="reset" disabled="" aria-label="Clear Search">
                                            <span class="ac-gn-searchform-reset-background"></span>
                                        </button>
                                    </div>
                                <input type="hidden" id="search-hidden-input" value="Support" name="group"></form>
                                <button id="ac-gn-searchview-close-small" class="ac-gn-searchview-close ac-gn-searchview-close-small" aria-label="Cancel Search">
                                        <span class="ac-gn-searchview-close-cancel" aria-hidden="true">
                                            Cancel
                                        </span>
                                    </button>
                            </div>
                        </div>
                        <aside id="ac-gn-searchresults" class="ac-gn-searchresults" data-string-quicklinks="Quick Links" data-string-suggestions="Suggested Searches" data-string-noresults="">
                <section class="ac-gn-searchresults-section ac-gn-searchresults-section-defaultlinks">
                    <div class="ac-gn-searchresults-section-wrapper">
                                    <div class="search-group-checkbox"><input id="group-input" type="checkbox" name="group-filter" checked="" value="Support">Only search within “<span id="group-search-label">Support</span>”</div>
                        <h3 class="ac-gn-searchresults-header ac-gn-searchresults-animated">Quick Links</h3>
                        <ul class="ac-gn-searchresults-list" id="defaultlinks" role="listbox">
                        <li class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a href="https://developer.apple.com/ios/" id="search-group-link-0" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">iOS 16</a></li><li class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a href="https://developer.apple.com/news/" id="search-group-link-1" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">Latest
```

News
<li class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a
href="https://developer.apple.com/documentation/storekit/appstore/environment/3963900-xcode/" id="search-group-link-2" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">xcode
<li class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a
href="https://developer.apple.com/xcode/whats-new/" id="search-group-link-3" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">What’s included in Xcode
<li class="ac-gn-searchresults-item ac-gn-searchresults-animated"><a
href="https://developer.apple.com/videos/play/wwdc2022/110345/" id="search-group-link-4" class="ac-gn-searchresults-link ac-gn-searchresults-link-defaultlinks">What’s new in Endpoint Security
5 Quick Links

</section>
</aside>

<button id="ac-gn-searchview-close" class="ac-gn-searchview-close" aria-label="Cancel Search">

</button>
</aside>

</nav>

<script src="/assets/scripts/ac-globalnav.built.js?41172203193"></script>
<link rel="stylesheet" href="/assets/styles/search.css?41172203193">
<script src="/assets/scripts/search.js?41172203193"></script>

<!-- metrics -->
<script>
/* RSID: */
var s_account="awdappledeveloper"
</script>
<script src="/assets/metrics/scripts/analytics.js?10202020"></script>
<script>
s.pageName= AC && AC.Tracking && AC.Tracking.pageName();
s.channel="www.en.developer"
s.channel="www.en.developer";

/************* DO NOT ALTER ANYTHING BELOW THIS LINE ! **************/
var s_code=s.t();if(s_code)document.write(s_code)

```
</script>
<!-- /metrics -->

        <link rel="stylesheet" property="stylesheet"
href="/assets/styles/localnav.css" type="text/css">
<input type="checkbox" id="localnav-menustate" class="localnav-menustate">
<div id="localnav-sticky-placeholder" class="css-sticky"></div><nav
id="localnav" class="localnav localnav-scrim css-sticky" data-sticky=""
role="navigation">
        <div class="localnav-wrapper">
                <div class="localnav-background"></div>
                <div class="localnav-content">
                        <h2 class="localnav-title">
                                <a href="/support/">Support</a>
                        </h2>

                        <div class="localnav-menu">
                                <a href="#localnav-menustate" class="localnav-
menucta-anchor localnav-menucta-anchor-open" id="localnav-menustate-
open">
                                        <span class="localnav-menucta-anchor-
label">Open Menu</span>
                                </a>
                                <a href="#" class="localnav-menucta-anchor
localnav-menucta-anchor-close" id="localnav-menustate-close">
                                        <span class="localnav-menucta-anchor-
label">Close Menu</span>
                                </a>
                                <div class="localnav-menu-tray">
                                        <ul class="localnav-menu-items">
                                                <li class="localnav-menu-item">
                                                        <a href="/support/"
class="localnav-menu-link current" aria-disabled="true">Overview</a>
                                                </li>
                                                <li class="localnav-menu-item">
                                                        <a href="/support/articles/"
class="localnav-menu-link">Articles</a>
                                                </li>
                                                <li class="localnav-menu-item">
                                                        <a href="/support/terms/"
class="localnav-menu-link">Agreements and Guidelines</a>
                                                </li>
                                        </ul>
                                </div>
                                <div class="localnav-actions localnav-actions-center">
                                        <div class="localnav-action localnav-action-
menucta" aria-hidden="true">
                                                <label for="localnav-menustate"
class="localnav-menucta">
                                                        <span class="localnav-menucta-
chevron"></span>
                                                </label>
                                        </div>
```

```
                                        <div class="localnav-action localnav-action-
button">
                                                <a class="localnav-button button button-
compact button-pill" href="/contact/">Contact us
                                                        <span class="localnav-action-
product">Support</span>
                                                </a>
                                        </div>
                                </div>

                        </div>
                </div>
        </div>
</nav>
<label id="localnav-curtain" for="localnav-menustate"></label>
<script src="/assets/scripts/ac-localnav.built.js"></script><div id="localnav-
viewport-emitter" data-viewport-emitter-dispatch="" data-viewport-emitter-
state="{&quot;viewport&quot;:&quot;small&quot;,&quot;orientation&quot;:&quo
t;portrait&quot;,&quot;retina&quot;:true}"></div>
<script type="text/javascript" src="/assets/scripts/localnav.js"></script>


                <main id="main" class="main" role="main">

                <section class="section section-overview">
                        <figure class="image-support-hero" data-hires="false" data-
figure-id="image-support-hero"></figure>
                        <div class="section-content">
                                <div class="row">
                                        <div id="hero" class="column large-centered
large-6 medium-7 small-8 text-center">
                                                <h1 class="typography-hero-headline
margin-top-small">Developer Support</h1>
                                                <p class="typography-intro">Get help
with development and app management tools, view documentation, connect
with other Apple developers, submit bug reports, and more.</p>
                                        </div>
                                </div>
                        </div>
                </section>

                <section class="section bg-light">
                        <div class="section-content padding-top padding-bottom">
                                <div class="large-8 medium-12 small-12 large-
centered">
                                        <div class="row">
                                                <div id="guides-and-documentation"
class="column large-centered large-12 text-center">
                                                        <h2>Guides and
Documentation</h2>
                                                        <p class="large-7 large-centered
medium-8 small-12">Find details and step-by-step instructions on how to use
Apple development tools and resources.</p>
                                                </div>
```

```
                                        </div>
                                        <div class="row">
                                                <div class="column large-4 medium-4
small-12 text-center">
                                                        <a
href="https://developer.apple.com/documentation/xcode" class="block">
                                                                <img
src="https://developer.apple.com/assets/elements/icons/xcode-12/xcode-12-
64x64_2x.png" width="64" height="64" alt="" data-hires-
status="pending"><br>
                                                                <p><span class="block-link
more nowrap">Xcode</span></p>
                                                        </a>
                                                </div>
                                                <div class="column large-4 medium-4
small-12 text-center">
                                                        <a
href="https://help.apple.com/developer-account/" class="block">
                                                                <img
src="/assets/elements/icons/wwdr-unified/account-c.svg" width="64"
height="64" alt="" data-hires-status="pending"><br>
                                                                <p><span class="block-link
more nowrap">Developer Account</span></p>
                                                        </a>
                                                </div>
                                                <div class="column large-4 medium-4
small-12 text-center">
                                                        <a
href="https://help.apple.com/app-store-connect/" class="block">
                                                                <img
src="https://developer.apple.com/assets/elements/icons/asc-outline/asc-outline-
64x64_2x.png" width="64" height="64" alt="" data-hires-
status="pending"><br>
                                                                <p><span class="block-link
more nowrap">App Store Connect</span></p>
                                                        </a>
                                                </div>
                                        </div>
                                </div>
                                <div class="large-10 medium-12 small-12 large-
centered">
                                        <div class="row divider-top margin-top margin-
bottom small-hide"></div>
                                        <div class="row">
                                                <div class="column large-4 small-12 text-
center">
                                                        <a href="/documentation/"
class="block">
                                                                <figure class="router-icon-
documentation" data-hires-status="pending"></figure>
                                                                <p><strong>Developer
Documentation</strong></p>
```

```
                                                        <p class="large-12 medium-
11 large-centered small-10 no-margin-top">Browse the latest API reference,
articles, and sample code.</p>
                                                        <p><span class="block-link
more nowrap">View topics</span></p>
                                                    </a>
                                                </div>
                                                <div class="column large-4 small-12 text-
center">
                                                    <a
href="/documentation/technotes" class="block">
                                                        <figure class="router-icon-
document" data-hires-status="pending"></figure>

                                <p><strong>Technotes</strong></p>
                                                        <p class="large-12 medium-
11 large-centered small-10 no-margin-top">Find timely documents from Apple
Developer Technical Support.</p>
                                                        <p><span class="block-link
more nowrap">View technical articles</span></p>
                                                    </a>
                                                </div>
                                                <div class="column large-4 small-12 text-
center">
                                                    <a href="/support/articles/"
class="block">
                                                        <figure class="router-icon-
document" data-hires-status="pending"></figure>
                                                        <p><strong>Support
Articles</strong></p>
                                                        <p class="large-12 medium-
11 large-centered small-10 no-margin-top">Learn about membership,
distribution, development, and more.</p>
                                                        <p><span class="block-link
more nowrap">View articles</span></p>
                                                    </a>
                                                </div>
                                            </div>

                                        </div>
                                    </div>
                                </section>

                                <section class="section">
                                    <div class="section-content padding-top-small">
                                        <div class="row">
                                            <div id="news-and-updates" class="column
large-centered large-6 medium-8 small-12 text-center">
                                            <a href="/news/" class="block">
                                                <h2>News and Updates</h2>
                                                <p>Get the latest announcements and
recommendations for Apple developers.</p>
                                                <p><span class="block-link more">Read
news and updates</span></p>
```

```
                                        </a>
                                        </div>
                                </div>
                        </div>
                        <figure class="image-news-and-updates" data-figure-
id="image-news-and-updates" data-hires-status="pending" style="background-
image: url(&quot;https://developer.apple.com/support/images/news-
small_2x.png&quot;);"></figure>
                </section>

                <div class="row row-flex">
                        <section class="section side-by-side section-forums">
                                <div class="section-content">
                                        <a href="/forums/" class="block">
                                                <img
src="https://developer.apple.com/assets/elements/icons/forum/forum-
64x64_2x.png" width="64" height="64" alt="" data-hires-status="pending">
                                                <h2><span class="eyebrow">Developer
Forums</span>Ask other developers.</h2>
                                                <p>Post questions and share technical
information with fellow developers and Apple engineers on a variety of
development topics.</p>
                                                <p><span class="block-link more">Visit
the forums</span></p>
                                        </a>
                                </div>
                        </section>
                        <section class="section side-by-side section-bug-reporter">
                                <div class="section-content">
                                        <a href="/bug-reporting/" class="block">
                                                <img
src="https://developer.apple.com/assets/elements/icons/fba-mac/feedback-
assistant-mac-64x64_2x.png" width="64" height="64" alt="" data-hires-
status="pending">
                                                <h2><span class="eyebrow">Feedback
Assistant</span>Submit a bug report.</h2>
                                                <p>With Feedback Assistant, you can file
bug reports, and request enhancements to APIs and developer tools.</p>
                                                <p><span class="block-link
more">Learn about reporting bugs</span></p>
                                        </a>
                                </div>
                        </section>
                </div>

                <section class="section section-contact-us">
                        <div class="section-content padding-top-small padding-
bottom-small">
                                <div class="row">
                                        <div id="contact-us" class="column large-
centered large-6 medium-8 small-12 text-center">
                                                <img src="/support/images/phone-circle-
fill.svg" width="64" height="64" class="center" data-hires-status="pending">
                                                <h2>Contact us.</h2>
```

```
                                        <p>Have a question? Apple Developer Support can help. Receive guidance by phone or email.</p>
                                        <p><a href="/contact/" class="more nowrap">Contact Apple Developer Support</a></p>
                                    </div>
                                </div>
                            </div>
                        </section>

                        <section class="section bg-light">
                            <div class="section-content padding-top-small padding-bottom-small">
                                <div class="row">
                                    <div id="system-status" class="column large-centered large-7 medium-7 small-11 text-center">
                                        <h3>System Status</h3>
                                        <p>If you’re experiencing an issue with developer tools or services, find out if there’s maintenance in progress or a <span class="nowrap">known issue.</span><br><a href="/system-status/" class="more nowrap">View system status</a></p>
                                    </div>
                                </div>
                            </div>
                        </section>

                    </main>


                <link rel="stylesheet" href="/assets/styles/footer.dist.css?41172203193">
<footer id="footer" class="footer" role="contentinfo" aria-labelledby="footer-label">
                <div class="footer-content">
                    <h2 class="footer-label" id="footer-label">Developer Footer</h2>

                    <developer-breadcrumbs style="display: block;">

                                    <nav class="footer-breadcrumbs" aria-label="Breadcrumbs"><a href="https://www.apple.com/" class="home footer-breadcrumbs-home"><span class="footer-breadcrumbs-home-icon" aria-hidden="true" data-hires-status="pending"></span><span class="footer-breadcrumbs-home-label">Apple</span></a><div class="footer-breadcrumbs-path"><ol class="footer-breadcrumbs-list"><li class="footer-breadcrumbs-item"><a href="/">Developer</a></li><li class="footer-breadcrumbs-item">Support</li></ol></div></nav></developer-breadcrumbs>
                        <nav class="footer-directory" aria-label="Apple Developer Directory" role="navigation">
                    <!--googleoff: all-->
                    <div class="footer-directory-column">
                        <input class="footer-directory-column-section-state" type="checkbox" id="footer-directory-column-section-state-platform">
                        <div class="footer-directory-column-section">
                            <label class="footer-directory-column-section-label" for="footer-directory-column-section-state-platform">
```

```
                                <h3 class="footer-directory-column-section-
title">Platforms</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-platform"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ios/">iOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/ipados/">iPadOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/macos/">macOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tvos/">tvOS</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/watchos/">watchOS</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-tools">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-tools">
                                <h3 class="footer-directory-column-section-
title">Tools</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-tools"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift/">Swift</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swiftui/">SwiftUI</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/swift-playgrounds/">Swift
Playgrounds</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/testflight/">TestFlight</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode/">Xcode</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/xcode-cloud/">Xcode
Cloud</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/sf-symbols/">SF
Symbols</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-topics">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-topics">
                                <h3 class="footer-directory-column-section-
title">Topics &amp; Technologies</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-topics"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessibility/">Accessibility</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/accessories/">Accessories</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-extensions/">App
Extensions</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/">App
Store</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/audio/">Audio &amp;
Video</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/augmented-
reality/">Augmented Reality</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/business/">Business</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/">Design</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/distribute/">Distribution</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/education/">Education</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/fonts/">Fonts</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/games/">Games</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/health-fitness/">Health
&amp; Fitness</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/in-app-purchase/">In-App
Purchase</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/localization/">Localization</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/maps/">Maps &amp;
Location</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/machine-learning/">Machine
Learning</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/security/">Security</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/safari/">Safari &amp;
Web</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-resources">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-resources">
                                <h3 class="footer-directory-column-section-
title">Resources</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-resources"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/documentation/">Documentation</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/curriculum/">Curriculum</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/download/">Downloads</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://developer.apple.com/forums/">Forums</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/videos/">Videos</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-support">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-support">
                                <h3 class="footer-directory-column-section-
title">Support</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-support"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/support/articles/">Support
Articles</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/contact/">Contact
Us</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/bug-reporting/">Bug
Reporting</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/system-status/">System
Status</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-account">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-account">
                                <h3 class="footer-directory-column-section-
title">Account</h3>
                        </label>
```

```
                        <a href="#footer-directory-column-section-state-account"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/account/">Apple
Developer</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://appstoreconnect.apple.com/">App Store Connect</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/account/ios/certificate/">Certificates, IDs, &amp; Profiles</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="https://feedbackassistant.apple.com/">Feedback Assistant</a></li>
                        </ul>
                </div>
        </div>

        <div class="footer-directory-column">
                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-programs">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-programs">
                                <h3 class="footer-directory-column-section-
title">Programs</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-programs"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/">Apple Developer
Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/enterprise/">Apple
Developer Enterprise Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/small-business-
program/">App Store Small Business Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="https://mfi.apple.com/">MFi
Program</a></li>
```

```
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/news-
partner/">News Partner Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/video-
partner/">Video Partner Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/security-bounty/">Security
Bounty Program</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/programs/security-research-
device/">Security Research Device Program</a></li>
                        </ul>
                </div>

                <input class="footer-directory-column-section-state"
type="checkbox" id="footer-directory-column-section-state-events">
                <div class="footer-directory-column-section">
                        <label class="footer-directory-column-section-label"
for="footer-directory-column-section-state-events">
                                <h3 class="footer-directory-column-section-
title">Events</h3>
                        </label>
                        <a href="#footer-directory-column-section-state-events"
class="footer-directory-column-section-anchor footer-directory-column-section-
anchor-open"> <span class="footer-directory-column-section-anchor-
label">Open Menu</span> </a>
                        <a href="#" class="footer-directory-column-section-anchor
footer-directory-column-section-anchor-close"> <span class="footer-directory-
column-section-anchor-label">Close Menu</span> </a>
                        <ul class="footer-directory-column-section-list">
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/accelerator/">App
Accelerators</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/app-store/app-store-
awards/">App Store Awards</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/design/awards/">Apple
Design Awards</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link"
href="/learn/experts/#academies">Apple Developer Academies</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/entrepreneur-
camp/">Entrepreneur Camp</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/tech-talks/">Tech
Talks</a></li>
                                <li class="footer-directory-column-section-item"><a
class="footer-directory-column-section-link" href="/wwdc/">WWDC</a></li>
                        </ul>
                </div>
        </div>
```

```
        <!--googleon: all-->
</nav>
       <section class="footer-mini" vocab="http://schema.org/"
typeof="Organization">
        <div class="footer-mini-news">
                <div class="copy">
                        To view the latest developer news, visit <a
href="/news/">News and Updates</a>.
                </div>
                <div class="content">
                        <div class="color-scheme-toggle" role="radiogroup"
tabindex="0" aria-label="Select a color scheme preference">

                                <label data-color-scheme-option="light">

                                        <input type="radio" value="light"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Light</div>

                                </label>

                                <label data-color-scheme-option="dark">

                                        <input type="radio" value="dark"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Dark</div>

                                </label>

                                <label data-color-scheme-option="auto">

                                        <input type="radio" value="auto"
autocomplete="off"
onchange="window.setPreferredColorScheme(event.target.value)">

                                        <div class="text">Auto</div>

                                </label>

                        </div>
                        <script async="" src="/assets/scripts/color-scheme-
toggle.js"></script>
                </div>
        </div>
        <link rel="stylesheet" href="/assets/styles/language-dropdown.css?
41172203193">
        <div class="language-dropdown dropdown-container" data-
lang="complete">
                <select class="dropdown" aria-label="Language
Dropdown"><option
```

value="https://developer.apple.com/support/">English</option><option
value="https://developer.apple.com/cn/support/">□□□□</option><option
value="https://developer.apple.com/jp/support/">□□□</option><option
value="https://developer.apple.com/kr/support/">□□□</option><option
value="https://developer.apple.com/de/support/">Deutsch</option><option
value="https://developer.apple.com/es/support/">Español</option><option
value="https://developer.apple.com/fr/support/">Français</option><option
value="https://developer.apple.com/it/support/">Italiano</option><option
value="https://developer.apple.com/pt/support/">Português</option></select>

<script async="" src="/assets/scripts/lib/jquery/jquery.language-dropdown.js?41172203193"></script>

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</section>

</footer>

</body></html>